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PHILOSOPHIA

ULTIMA

OR

SCIENCE OF THE SCIENCES

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VOL. II.

REFERENCE MATERIAL
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THE HISTORY OF THE SCIENCES

AND

THE LOGIC OF THE SCIENCES.

BY

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PREFACE

TO THE

SECOND VOLUME.

In sending forth this volume the author cannot affect indifference concerning a work to which he has devoted the thirty best years of his life. For the same reason no one can see more plainly than himself how far he has fallen short of his high aim. His hope is that the aim itself may have been made clear and attractive to other minds who shall pursue it with increasing success in time to come.

April, 1889.

CONTENTS.

INTRODUCTION.

PAGE

THE AIM AND SCOPE OF PHILOSOPHY, ... 3–31

PART I.

PHILOSOPHY AS THE SCIENCE OF THE SCIENCES.

CHAPTER I.

THE PURIFICATION OF THE SCIENCES.

SECTION I. SOURCES OF ERROR IN THE SCIENCES, ... 34–41

SECTION II. DEFINITION OF THE SCIENCES, ... 41–52

SECTION III. CLASSIFICATION OF THE SCIENCES, ... 52–79

SECTION IV. PHILOSOPHICAL SCHEME OF THE SCIENCES, . . . 79–112

SECTION V. CONDITIONS OF A SCIENCE OF THE SCIENCES, . . 112–126

CHAPTER II.

SURVEY OF THE SCIENCES.

SECTION I. ASTRONOMY, RATIONAL AND REVEALED, . . . 130–148

SECTION II. GEOLOGY, RATIONAL AND REVEALED, ... 148–170

SECTION III. ANTHROPOLOGY, RATIONAL AND REVEALED, . . . 170–204

SECTION IV. PSYCHOLOGY, RATIONAL AND REVEALED, . . . 204–230

SECTION V. SOCIOLOGY, RATIONAL AND REVEALED, ... 239–259

SECTION VI. THEOLOGY, RATIONAL AND REVEALED, . . . 259–292

CHAPTER III.

THE SCIENCE OF THE SCIENCES.

SECTION I. PHILOSOPHIC SCIENCE, ... 296–330

REALISM AND IDEALISM.

EMPIRICISM AND TRANSCENDENTALISM.

POSITIVISM AND ABSOLUTISM.

DOCTRINE OF REVEALED KNOWLEDGE.

PAGE

SECTION II. METAPHYSIC SCIENCE, ... 330–357

MONISM AND DUALISM.

CREATIONISM AND EVOLUTIONISM.

OPTIMISM AND PESSIMISM.

DOCTRINE OF REVEALED BEING.

SECTION III. THEOSOPHIC SCIENCE, ... 357–406

NATURALISM AND SUPER-NATURALISM.

RATIONALISM AND SUPER-RATIONALISM.

AGNOSTICISM AND GNOSTICISM.

SECTION IV. COMPLETE THEORY OF THE SCIENCES, . . . 406–410

PART II.

PHILOSOPHY AS THE ART OR LOGIC OF THE SCIENCES.

CHAPTER I.

LOGIC OF THE EMPIRICAL SCIENCES, ... 410–415

CHAPTER II.

LOGIC OF THE METAPHYSICAL SCIENCES, ... 416–437

SECTION I. EVIDENCES OF THEISM.

SECTION II. EVIDENCES OF NATURAL THEOLOGY.

SECTION III. EVIDENCES OF NATURAL RELIGION.

SECTION IV. EVIDENCES OF REVEALED RELIGION.

CHAPTER III.

LOGIC OF THE SCIENCE OF SCIENCES, ... 438–462

CANON I. REASON AND REVELATION AS COMPLEMENTAL IN EACH SPECIAL SCIENCE.

CANON II. REASON AND REVELATION AS ADJUSTED IN THE SCALE OF THE SCIENCES.

CANON III. REASON AND REVELATION AS ENSURING THE PERFECTIBILITY OF SCIENCE.

INTRODUCTION.

THE

AIM AND SCOPE OF PHILOSOPHY.

INTRODUCTION.

PHILOSOPHY, as the word implies, is the wooing of wisdom, the search for the reason of things, the inquiry into the laws and causes of phenomena, the study of the problem of the universe, the pursuit of infinite knowledge and absolute truth.

Philosophy, in this full sense, is at once a passion, a duty and a glory of our nature; a passion, since the love of wisdom is innate, unquenchable, often superior to all other propensities; a duty, since the disuse of reason as well as its abuse would be but folly and sin that would end in suffering; and a glory, since by a devout curiosity the creature may enter into the wisdom of the Creator, and acquire dominion and dignity in the creation.

Philosophy perfected, the final or ultimate philosophy, would be an unerring pursuit of wisdom, an exhaustive search for the reason of things, a trained inquiry into the laws and causes of phenomena, a logical process of solving the problem of the universe, an approved theory and art of perfect knowledge.

Philosophy, as thus defined, proposes three chief questions: What can we know? How can we know? Why should we know? The full answer to the first question would be a theory of perfect knowledge; the full answer to the second question would be an organon or art of perfect knowledge; and the full answer to the third question would be a doctrine of applied knowledge. And these three questions follow in this order, both logically and practically. Until we have clearly ascertained the knowable, we may not fully learn the process of knowing; and only after gaining knowledge itself

will we rightly appreciate it. It is also true historically that philosophy has ever nursed the sciences, that the sciences have yielded the arts, and the arts shed forth the utilities and dignities of life. These three questions, moreover, are important by all that makes philosophy itself important. In their right solution the whole problem of philosophy would be exhausted. Because they have not hitherto been solved, all philosophy is still more or less errant, vague and partial. Ere they can be fully solved, generations of philosophers may pass away; and even when fully solved, Philosophy would then be only equipped and started in an endless pursuit and ceaseless acquisition of infinite wisdom.

Philosophy, therefore, the final philosophy, as presented in this work, could not claim to contain that finished system of perfected knowledge which might be grasped by Omniscience alone, but simply to project an ultimate or ideal scheme of research, ever unfolding, yet never fulfilled through all time to come. And the aim will be to sketch such a scheme in three parts answering to the three chief philosophical questions; in the first part, a Science of the Sciences (SCIENTIA SCIENTIARUM) answering to the question, What can we know; in the second part, an Art of the Sciences (ARS SCIENTIARUM) answering to the question, How can we know; and in the third part, a Science of the Arts (SCIENTIA ARTIUM) answering to the question, Why should we know.

The first part of the work will treat of the first chief question of philosophy, *What can we know?* But the moment this question is raised, it will be found to involve the two subsidiary inquiries, What is it to know? What do we know? It involves the former inquiry, because true knowledge as yet is confounded with much false knowledge; and it involves the latter inquiry, because it is only through the known that we advance to the knowable. And these inquiries must be pursued historically, because scientific knowledge has been a gradual deposit of past generations. In other words, to construct a science of the sciences, we need to eliminate all spurious science, to examine all existing science, and thereon to premise all prospective science. This part of the treatise, therefore, will naturally fall into three chapters in reply to

the three inquiries thus unfolded; the first chapter affording an expurgation or purification of the sciences, in reply to the inquiry, What is it to know? the second chapter affording a review or survey of the sciences, in reply to the inquiry, What do we know? and the third chapter affording a doctrine or theory of the sciences, in fulfillment of the whole question, What can we know?

The second part of the work will treat of the second chief question of philosophy, *How can we know?* This question too, at once divides itself into two special queries: How do we know? How may we know? It includes the former query, because the most certain portions of our knowledge will best teach us the process of knowing; and it includes the latter query, because the less certain portions of our knowledge must advance through some like process. And the two queries will fitly find their place in our scheme of the sciences, as embracing both an empirical and a metaphysical section or portion, to be correlated and harmonized. This part of the treatise, therefore, will have a chapter on the logic of the empirical sciences or certain portions of our knowledge, in illustration of the query, How do we know? and also a chapter on the logic of the metaphysical sciences or less certain portions of our knowledge, in illustration of the query, How may we know? and then a chapter on the logic of the science of the sciences or entire body of our knowledge, both rational and revealed, in fulfillment of the whole question, How can we know?

The third part of the work will treat of the third chief question of Philosophy, *Why should we know?* In answer to this question, the ends and uses of knowledge as applied in common life, or the sciences as issuing practically in correspondent arts, will require preliminary treatment, and three special topics will then naturally follow; a chapter on the science of the useful arts, such as agriculture, mining, manufactures, navigation; a chapter on the science of the æsthetical arts, such as music, painting, sculpture, architecture; and a chapter on the science of the ethical arts or learned professions, such as law, medicine and divinity. At length, the principles which ensure the rational control of man over

nature having been clearly unfolded, the way may be open for projecting the ultimate system of society on the basis of the perfected sciences and arts.

Such are the chief problems of philosophy. Their difficulty has become plain enough in their very statement. To attempt them rashly, would be to stumble at the threshold. To pursue them by a false route, would be only laboring for naught. First of all, at the outset, we need to pause and ascertain the true method of their solution, and therefore the method to be followed throughout this treatise. It has several elements which henceforth should be kept in mind.

In the first place, these great problems must be solved inductively. The bulk of our knowledge comes from experience. The sciences are but masses of empirical knowledge, and like other phenomena are regulated presumably by laws which can only be inductively ascertained. By no mere scrutiny of the cognitive faculty itself can we foresee their career through the infinitude of truth. By no amount of brilliant surmises or sagacious conjectures can we leap at once to their goal. They must be taken as they are, and patiently studied without prejudice or partiality. To enter among them deductively from assumed principles with foregone notions, is to fly in the face of them. Theories of knowledge which are based upon little knowledge, are like theories of the world which have no ground in the actual world. Philosophies of science which largely ignore science itself, are like the so-called philosophies of nature which defy the whole course of nature, and would reconstruct the universe *a priori* by sheer logic or speculation, without empirical material and inductive research. One after another such systems have dashed against stubborn fact and common sense, until history has become strewn with their wrecks. Let us be warned that philosophy, as the science of the sciences, can only arise in and through the sciences themselves, after, rather than before, their development. And hence the title of this work is not *Philosophia Prima*, but *Philosophia Ultima*.

In the second place, these great problems must be solved by the collective intelligence. Even more than common

knowledge the sciences are objective social phenomena which many minds have produced and which no single mind can fully master. And still more must the task of their logical organization be a joint effort. Individual workers may take share in it, and often must labor for it apart and alone. But no one can achieve it single-handed. The attempt to evolve from the inner consciousness the whole process and structure of the sciences is but spinning a gossamer web of abstractions. Philosophers who have sought thus to exhaust philosophy in themselves by one effort, have only played at omniscience and been forgotten. Their systems have lacked whole sciences which they ignored and retained others only warped and colored by their own idiosyncrasy. Even such as have done good service have wrought out the merest fragments of truth and knowledge. The work which remains is to collect and organize such fragments; to rally philosophers, though unconsciously, to the common task of philosophy, rather than to assail and scatter them. In the realm of truth there are no monarchs that can only reign by the death of their rivals. Existing systems need not so much to be superseded as sifted and blended. This treatise, therefore, is largely a digest of opinions, theories and doctrines in all the sciences, with the view of converging the best thought of the best minds upon the highest problems of knowledge. It does not pretend to finish philosophy, but simply to point toward the *Philosophia Ultima.*

In the third place, these great problems can only be solved by successive generations. The gradual process of knowledge combines with the greatness of the task and the shortness of life to prolong their solution. In the race, as in the individual, the reason of man matures slowly, though on a grander scale in time and space. The field of thought and research is so vast, that premises already laid in a remote past can only have their full conclusion in as remote a future. The sciences do not spring full-grown from any people or any epoch; nor can their whole logical procedure be mastered by any age without the help of former and following ages. Nations or centuries which have stood aside or aloof from the general march of human reason, have but perished in

their fancied wisdom as mere stragglers or deserters and left no record in the annals of philosophy. The most favored peoples and periods have only furnished materials for a growing temple of knowledge of which a few forward minds had vague glimpses. We have simply entered into their labors. Their philosophic task has become ours, to be awhile pursued and then in turn bequeathed to our intellectual descendants. In the kingdom of mind it is the dead who ever rule the living. Would we frame a theory and system of perfectible knowledge, we can neither ignore the science of the past, nor discount that of the future. Though this treatise should digest and mature all previous philosophy, it would merely afford the latest outlook of the *Philosophia Ultima.*

We are now ready to estimate the high aims of philosophy in thus solving severally its three chief problems. And first, as a science of the sciences, philosophy aims at that one supreme science to which each of them shall contribute and in which all of them shall be combined. It would ascend above them into the region of pure thought and survey their whole field of research as on all sides it shades off into infinity. It would take impartially into view their existing masses of strict knowledge, together with the crude speculations which they contain and the unsolved problems which they still present. Having thus digested them for inductive study, it would inquire into their cognitive process, the laws of their logical connection and historical evolution, and the goal of their future development. For this purpose it would bring together all previous theories of knowledge, theories of being and theories of revelation, upon which they have proceeded, and would thoroughly sift and test such theories. At length, it would thus unfold that true theory or doctrine of science which shall embrace all the ascertained provinces of cognition, the psychical as well as the physical, the metaphysical as well as the empirical, and shall therein combine all the approved means of knowledge, intuition with experience, divine revelation with human reason. And so philosophy would become itself the last and highest science as well as the very flower and crown of all the sciences.

As an art of the sciences, also, philosophy aims at that comprehensive logic by which their processes are to be severally traced and their products to be wrought into a system. It would include the art as well as the science of logic, and apply that art in accordance with the true theory of knowledge as already ascertained. In the empirical region of knowledge it would set forth the canons of inductive research and evidence, and unfold logically as well as historically the extant bodies of science, both physical and psychical. In the metaphysical region of knowledge it would likewise set forth the canons of deductive reasoning and proof, and array in due order the cumulative evidences of religion, both natural and revealed. In the wider realm of philosophic thought it would then bring together the empirical and metaphysical provinces of knowledge, and proclaim the logical rules for correlating reason and revelation in those provinces. At length, by such means, it would begin to frame existing theories and doctrines into a perfect system of the sciences. And thus would philosophy appear not merely as the crowning science but also as a consummate intellectual art, as a logic of the ages, as a dialectic of successive civilizations, as a vast architectonic of human reason, building the temple of truth into a pantheon of sages.

As a science of the arts, still further, philosophy aims at an intelligent application of all knowledge to human welfare. It would descend from the region of pure thought into the sphere of phenomena, to modify and control them through their ascertained laws. It would thus guide the arts by means of the sciences upon which they severally depend, and in accordance with their normal as well as actual relations. Through a science of the physical arts it would seek to transform the whole globe into one human organism, knit together with telegraphic nerves, traversed with lightning speed, armed with typographic, photographic, telescopic senses, and clad in new aspects of material power and grandeur. Through a science of the moral and social arts, it would lead on toward a regenerate society to be irradiated with knowlege and truth, to be transfused with philanthropy through all its races, ranks and classes, and to be made illus-

trious with deeds of virtue and goodness. At length, as a science of the religious arts, blending love with prayer, it might even match the old miracles of faith with new marvels of skill, and bring both man and the earth into spiritual as well as material intimacy with the whole host of heaven. And so would Philosophy at its goal be found to be a nurse of the arts no less than a mother of the sciences, the daughter of God and the lover of man.

Such philosophy, while pursuing these high aims, could not but become in its scope at once catholic and eclectic. It would recognize all other philosophies which have earned their right to be, and take into view their several claims and results; their various means of knowledge, both experience and intuition, common sense and genius, reason and revelation; their diverse modes of inquiry, both experiment and conjecture, observation and reasoning, induction and deduction; their extreme theories of cognition, both idealism and realism, empiricism and transcendentalism, positivism and absolutism. It would embrace all the known sciences, physical and psychical, empirical and metaphysical, rational and revealed, together with all existing religions, Judaism and Mahomedanism, Christianity and Brahminism, Protestantism and Catholicity. At the same time, it would not pursue these rash methods blindly or compact these crude systems into a mere medley. By a wise electicism it would cause them in their blending to check each others excesses, to reject their respective errors, and to combine their common truths in a growing consensus of schools and sects, of theories and doctrines, based upon the harmony of reason and faith and ever tending toward the oneness and fulness of knowledge.

Such philosophy, also, would be alike conservative and progressive. In the conservative spirit it would welcome truth as the daughter of time and not think to set aside the wisdom of ages in a day, or refute the consent of nations by a word. It would look for valuable knowledge in systems which have gained long and wide prevalence; in Greek wisdom as well as in Christian doctrine, in mediæval theology as well as in modern science, in German metaphysics as well

as in English physics, in European tradition as well as in American invention, in oriental thought as well as in occidental faith. It would accept such knowledge as the experience of the race, after ages of trial and myriads of tests. And yet it would not rest in it as a goal. In the progressive spirit, it would make it only a starting point of greater knowledge yet to come. It would not dream that the infinite truth has been attained, or the human capacity for it exhausted. From the height already reached it would but look forward to a growing science which shall yet make our boasted wisdom seem but the youth of the world, to an advancing Christianity which shall yet draw the latest as well as earliest religions in its train, and to an ever unfolding philosophy of which all true science and pure religion are but the precedent and the pledge.

Such philosophy, at length, would become not less practical than theoretical. At first sight, indeed, it might seem to be wholly theoretical. It would retire so far away from common life into the realms of contemplation. It would tend ever to speculation rather than to action. It would deal with concrete realities only so far as they could illustrate its own abstract verities. It would seek even knowledge itself as a mere acquisition of intelligence with no conscious regard to its uses. It would lose sight of any chance applications of the sciences in its eagerness to trace their ideal relations. Its only art would be the pure logic used in constructing science, and it would not be content until it had a doctrine of science as well as science itself. But although thus supremely theoretical in its aims it would soon be found not less practical in its issues. In fact the very distinction between the theoretical and the practical would vanish in its course. Its speculations would appear as feats of intellectual energy. Its logical art would but show forth a trained reason in action. The sciences which it fosters would be seen shedding their correspondent arts through all the walks of life; the psychical sciences yielding religious culture, social improvement, individual virtue, and the physical sciences yielding health, comfort and plenty. Even its most abstract effort to harmonize and organize them would but make them more coherent and

operative in their bearing upon common affairs. And thus at length all civilization would become permeated by its influence, as distant valleys are enriched by streams which have their source in the mountains and the clouds.

At this point the benefits of such philosophy might be argued from its manifest tendencies. It could be shown that were its aims fully accomplished, as fast as they came to effect, the grandest human ideals would be fulfilled. The theory of perfect knowledge would be mastered; the sciences would be organized into a logical system; the issuing arts would be arrayed for intelligent practice; and all the varied spheres of life, both spiritual and material, would be renovated and transformed. In the final outcome science would be fully harmonized with religion; the state would become coincident with the church; art would be resolved into worship; and earth merged into heaven. It is quite conceivable that the logic of ideas could thus issue in a logic of events.

The benefits of such philosophy might also be shown by its indirect effect upon other correlative interests. In its relation to the arts, it would reveal the economic principles of agriculture, manufactures and commerce; the aesthetical principles of music, painting, architecture; and the ethical principles of law, medicine and divinity. In its relation to the sciences it would unfold the inductive processes of mechanics, chemistry, organics, as well as the deductive processes of ethics, politics, dogmatics. And in its relation to religion it would establish the metaphysical grounds of theism, immortality, divine government, and ever increase, while it sifted, the evidences of Christianity. Although pursuing its own ideal aims it would thus incidentally promote the most practical concerns of civilization.

As yet, however, such arguments might seem vague and visionary to any but a philosophic mind. The populace can appreciate abstract thought or knowledge only when in presence of its useful results, and then with a mere unintelligent wonder. The artizan and the artist may care little for the physics which they unconsciously apply, and the lawyer and the divine may not have studied the ethics which they habitually practice. Even the strict scientist

may be ignoring or despising the logic which he unconsciously uses, and have scant respect for the thinker who is ever theorizing about knowledge instead of getting knowledge itself. And the philosopher, scorning ulterior ends and lower motives, may claim to be only seeking truth for its own sake and wisdom as the one pearl above price. Aristotle thus censures Simonides who wrote for hire, and insists that philosophy must be an end in itself, sought for no foreign utility but as pure theoretical knowledge ranking above that which is merely productive or valued for material results. Indeed, quite apart from its contents and issues, philosophy may be prized simply as a mental discipline or intellectual pursuit. And in this light it is most commonly appreciated by those who espouse it as a vocation.

Sir William Hamilton has shown us that ever since the word itself was devised, there has been an effort to distinguish the mere sophist from the philosopher, the pretender to wisdom from the lover of wisdom. The great sages, from Pythagoras to Socrates, boasted not that they had wisdom, but only that they sought wisdom. Plato taught that wisdom belongs to God alone, and termed man a mere hunter of truth. As such, indeed, he often seems more eager for the chase than for the game, or even ready to forego the game for the sake of the chase. "If" says Malebranche, "I held Truth captive in my hand, I would open my hand, in order that I might again pursue Truth." With still bolder enthusiasm Lessing exclaims, "Did the Almighty, holding in his right hand *Truth* and in his left hand *Search after Truth* deign to offer me the one I might prefer,—in all humility but without hesitation I would request *Search after Truth*." "It is not the goal of truth," says Richter, "but the course, which makes us happy." Accordingly the philosopher is sometimes described as a sort of mental athlete, using knowledge for the mere training of his powers and striving for truth itself as but a wreath of laurel. The disputes which rage in the schools are viewed as so many brilliant logomachies or intellectual tournaments in which trained thinkers appear performing feats of logic and learning with scholarly grace and dignity amid the applause of echoing disciples.

There is no doubt much that is ennobling in such views of the philosophic pursuit. They accord well enough with the philosophy here projected. No enthusiasm could be more pure and exalted than that which has been described as simply aspiring after absolute truth in its wholeness and oneness. No course of thought could better discipline the reasoning powers than that which we have seen would deal with pure knowledge itself, with the sciences as intellectual phenomena, and with their processes as logical laws. And no goal of ambition could so kindle fancy and hope as that which would take all history for a stadium, with rival schools in the race, and the renown of following ages as the prize. But love of fame does not always consist with love of truth. Mere intellectual excellence alone, though the highest, would not ensure the acquisition of knowledge. Feats of thought, masteries of logic, prodigies of learning, while yet astonishing and delighting the multitude, might fail of all due effect at last, as when the racer with his eye on the crowd rather than on the prize stumbles in reach of the goal. Not culture as an end for its own sake, but culture as a mean to the highest knowledge is the true philosophic spirit. The pursuit of wisdom is something more than a mere academic discipline or learned pastime or literary career. And the knowledge to be gained, the truth to be won, is no withering wreath, but an unfading crown, an inexhaustible boon, whereof the more we have the more we crave, which only increases our capacity with our acquisition, and which shall ever remain at once to tempt and to nerve our reason. "The inquiry of truth," says Lord Bacon, "is the love-making or wooing of it; the knowledge of truth is the presence of it; the belief of truth is the enjoying of it as the sovereign good of human nature." In this high sense, both as to its aims and its issues, Philosophy will ever be its own exceeding great reward.

And yet the pleasures attending the philosophic pursuit are rare and difficult. Not every one is born to be a philosopher; nor is he always the happiest of mortals. In much wisdom, says the Hebrew sage, is much grief, and he that increaseth knowledge increaseth sorrow. To all the common riddles

of life he but adds an ever growing mass of graver problems, to task his brain, baffle his reason and overwhelm his fancy. At times he becomes oppressed with the all-surrounding mystery and sinks down for very weariness with the enigma of the world unsolved at his feet. Any moods of mental exaltation which visit him may only leave him the more sensitive to as deep depression. Instead of the countenance of friends and the enthusiasm of disciples, while pursuing his high task, he may have to face the indifference of the multitude, the scorn of practical minds and the jealousy of rivals. Should he dream of some more solid fame than the applause of the hour, it will but mock him as a mere posthumous spectre. What boots it now or then? How knows he but the cobwebs may gather over his neglected tomes, even if they do not share the fate of the thousand lost works of Solomon? Or he may be refuted by his successors as glibly as he is refuting his predecessors. "My master," said the shrewd valet of D'Alembert, "is a philosopher; he spends his life in writing books over which other philosophers will quarrel after he is dead."

There are still, however, amid such sorrows some pleasing solaces. The very epithet philosophical suggests the idea of contentment; not merely as expressed in the defiant sneer of the cynic, nor in the light laugh of the epicurean, nor yet in the proud resolve of the stoic, but in that rational as well as Christian satisfaction which finds more good than ill in the medley of life. If we regard the kind rather than the degree of happiness, the sage must seem far happier than the boor. His petty miseries are balanced by richer and higher intellectual joys. He would not forego the charms of wisdom for the stupid bliss of ignorance. The power of knowledge and the grace of culture are worth more to him than all the study and weariness which they cost him. He is oftener fascinated than appalled by the unfolding mystery of the universe. If he have gone farther into its secrets than his fellows, he can explain to himself their indifference and rise above their contempt for his ideal aims. Amid neglect and discouragement he remembers that he is dealing with truth which must survive after he is forgotten, and is only adding

to knowledge which will increase far beyond his own attainments. With Fichte he can call his work eternal and defy the very elements to destroy it. Or if indeed he be ahead of his time his eureka may still have the chastened rapture of one who dies in the new land he has found. "I can wait a hundred years for a reader," exclaimed Kepler, "since the Almighty has waited thousands of years for a discoverer."

There are also incidental recreations as well as consolations in the practice of philosophy. When explaining its nature, Pythagoras likens human life to the great games of Greece, which some attended to win the crown of victory and others to buy and sell, while the philosopher came neither for glory nor gain, but simply to look about him and take a note of what is done and in what manner. The true cosmopolite, he only visits the busy world as for a change of mental climate. Still within his own realm of thought, he is like a king in disguise, unknown, yet often knowing his fellows better than they know themselves. His study of their pursuits and passions has its own human charm. The rationale of trade and politics and fashion, of art and culture and charity, of labor and amusement and worship lend a crowning interest to the spectacle in which he mingles. Even the inequalities of wealth and poverty, luxury and squalor, grandeur and meanness, pass before him as a problem in hopeful solution. The very sports that he joins are like healthy breezes to scatter the solemn stuff from his brain, and though he wear the satiric mask, he still looks not unkindly on pleasures that he does not share. "Children," said Socrates, playing with some Athenian youth as a proud sophist approached them, "here comes a fool." And whether the sophists sneer or the pharisees frown, wisdom is justified of her children.

Above such lighter enjoyments are others more peculiar to his vocation and springing from acquaintance with books rather than men. Into that empire of the dead, which is grander than any empire of the living, he enters as into the native air and home of the soul. The good and great of all time become his companions. In the lonely midnight, through the deep silence of the past, he listens to the discourse of sages, babe-like Jupiters, as Emerson terms them, prattling to each

other across the centuries, while the busy world goes on unheeding below. With rapt fancy he beholds the solemn ghosts of great philosophic worthies as in their apotheosis, freed from earthly taint—Solomon, crowned doubly king with a wisdom richer than pearls and rubies; Socrates, with the cup of hemlock, quaffing immortality as protomartyr of philosophy; Plato, in his studious grove, dreaming of the ideal good and fair and true; Aristotle, with his stately walk, giving laws to the schools; Justin, in the Platonic mantle with the martyr halo as first defender of the faith; Aquinas, in the doctor's cap, kindling Aristotelian logic with angelic thought; Bacon, sitting as lord chancellor in the high court of nature and with no stain upon the ermine; Butler, the mitred sage, with benediction joining reason and faith in holy wedlock;—and all the lesser gods that crowd the historic pantheon. He does them reverence as the master minds among men and counts it honor enough if he may but sit at their feet.

Last and highest of such joys are those born of his own philosophic fancy as in the very seizure of truth and embrace of knowledge. They come to him only in moments of ecstatic thought, after vigils of study, at the goal of some arduous course of reasoning. He will seem at length to have mastered the last great secret of existence and be ready to exult in the problem of the world as about to be solved. The mood of his spirit becomes not less fervent in its devotion than intense in its abstraction. He stands as on a mount of vision, betwixt earth and heaven. The universe is bursting upon his view. He beholds not merely our little orb, bearing its radiant cross through swift epochs with growing arts and virtues, but the whole host of worlds in serried ranks of planets, suns and galaxies, evolving and dissolving with ever changing climates and histories, like golden clouds in the sunrise. Through and behind their phenomenal pageant he has glimpses of an Absolute Will whence they spring, an Infinite Wisdom wherewith they proceed, an Eternal Reason whereto they tend. Toward that sole primal Being he gazes as toward a sun beyond those clouds. One instant, the full splendor blinds him with tears; the next, the clouds have

rolled between again. He has seen but the hidings of a glory ever concealed while ever revealed; and he can only kneel before it in wonder and praise.

While yet these high pleasures are in full view, we are met by a grave suspicion. It is sometimes hinted that the pursuit of philosophy is unfriendly to the moral sentiments, that it subordinates them to the reason, kills them in their springs or thwarts their healthy action, and at length fosters, instead of them, the intellectual vices of pride, conceit and ambition. Especially in the higher sphere of religious thought and feeling, is its baleful fascination deprecated, as tending to sophisticate the conscience and undermine the faith. And the very words of Holy Writ are plead against the blighting intellectualism or seductive rationalism which it is thought to engender. Did not St. Paul charge Timothy to avoid profane babblings and oppositions of science falsely so called, by which some had already strayed into error? Was he not concerned for his brethren at Corinth lest the charms of Grecian wisdom should corrupt them from the simplicity of Christ, even as the serpent beguiled Eve by his subtlety? And has he not bidden the faithful for all time to beware lest any man spoil them through philosophy?

Now, it may be granted that there is some force in this scruple so far as it refers to any false inversion of the moral and intellectual powers; but so far as it claims to be based in a scriptural warning against all philosophy, it should be met at once upon its own ground, with a just exegesis. It will be found that the logical apostle to the Gentiles is only distinguishing a true from a false science and discriminating between a sound Christian philosophy or a philosophy that is after Christ, and one that is but vain and deceitful, because after the traditions of men and the rudiments of the world. Moreover, his own example was against such a scruple when he tendered to the Athenian agnostics a complemental revelation, thus striking the key-note of that harmony of science and religion which must ever be fundamental in true philosophy. Other sacred writers, too, have made piety all but identical with true wisdom, and ranked a divine knowl-

edge high among the Christian graces. In fact, the entire tenor of Holy Scripture may be cited as lending sanctions to the philosophic impulse.

One of these sanctions appears at the very beginning in the first Adam as depicted in Paradise. Is it surmised that curiosity is itself an erring impulse and knowledge but a loss of innocence? We look back to the pristine state of purity, and we see no mere animal savage or adult infant groping in doubt and ignorance, but a docile, eager learner, with God for a teacher, nature as a school, and angels to watch the pupilage. We behold a godlike intellect among inferior things and creatures, conning their species, proclaiming their laws, subduing their powers, and thus gaining even natural science until he walks the earth as a divinely cultured sage and intellectual lord of the world. Man while yet unfallen is shown to us as a heaven-taught seeker of wisdom. Call the story an allegory if you will; but there remains the scriptural ideal of a science once pure, and a philosophy that was divine.

Another sanction is seen in the pure intelligence of Christ as the second Adam for a new race and culture. Are we told that man fell from innocence only through his aspiring reason as seduced with the lure of forbidden knowledge by an incarnation of Satanic wisdom? We know that once at least in our human flesh there sojourned a sinless intellect on which the seductions of reason fell powerless as the temptations of sense. Immaculate in his own mental development, thenceforward he stimulated that of all after generations. While he was yet a child the world's science came a pilgrim to his cradle. When a youth he confounded doctors with his wisdom. When a man he stood amid the schools as the greatest of teachers, proclaiming mysteries which had been hidden from all former sages and had even baffled curious angels. And at length he bequeathed a doctrine which has filled the world with creeds and systems, which has gathered sciences and arts in its train, and which all radiant with civilization is still on its way to distant lands and ages. Incidental and earthly as such triumphs may seem to be, they yet show that intellectually as well as morally

Christ is the light of the world, and Christianity itself a nurse and friend of philosophy.

A crowning sanction may be found in the regenerate man or new creature in Christ as destined to intellectual perfection. Will it be claimed that pure intelligence as it shone in the first and the second Adam was exceptional and ever to be in contrast with a depraved understanding or carnal mind, which must now be suppressed or obliterated as the very source of death and sin? Christian experience shows, not only that the intellect must be used in conviction and conversion as well as in the higher graces of the soul, but also that it must itself share in the renewing process, become freed from error no less than sin, and be restored reasonably to the normal use of its powers. It is made a high duty to exercise the understanding as men, not as children pursuing folly, nor yet as brutes groping after a wisdom that is earthly, sensual and devilish. Moreover this purified reason, this spiritual mind, is ever tasked with new themes and problems, is put under divine tuition and enlightenment, and is led forth toward mysteries which have been hidden in the bosom of God from the beginning, but which in the ages to come are to be unfolded in all the riches of a full understanding. As yet, in this infantile stage of our development, we think, we discourse like children, but when we have reached the manhood of reason, all our present sciences and arts will have been outgrown as but playthings and fairy tales of the nursery, the mere alphabet of an ever growing culture. Now, with our discursive powers veiled in sense and clouded with passion, we see through a glass darkly, but then as with an open and clear intuition of truth we shall see face to face. Now, with our cognitive faculty limited and our sciences in fragments, we know in part; but then, as with the expanding vision of saints, of seraphs, of God himself, we shall know even as also we are known. Let this perfect knowledge, this infinite wisdom be for the individual alone or for the race also; let it be seized hereafter in heaven or be reached here upon earth; in the beatific vision or in a millenial apocalypse; it matters not; therein is set before us the fulfilled yearning, the realized dream of a true and pure philosophy.

We are thus brought next to consider the philosophic virtues and the graces which crown the complete philosophic character. These are the preliminary conditions of success in the pursuit of wisdom, without which the votary can neither enjoy her rewards nor claim her sanctions. Not more strict were the rules of knighthood; not more pure the vigils of the novitiate. Taken in their due order they afford a scale of ascending degrees of excellence by which to judge of any philosopher or school of philosophy.

At the base is a group of virtues, mainly intellectual in their origin but bordering on the moral region, and of fundamental importance. Such is that curiosity, or simple *love of knowledge* as an end in itself, which Aristotle claims to be a trait distinguishing man from the brutes and makes the very spring and motive of philosophy. As an intellectual passion it often dominates all the lower propensities, and becomes itself an appetite which grows by what it feeds on. If sustained by patience it toils alone amid dry details like the miser amid his hoard. When conjoined with courage it braves alike the terrors of nature and the cruelties of man. In its supreme moments it will even sacrifice to itself every other interest, gain, praise, kindred, all it holds most dear. As the due complement of such curiosity must then be added the virtue of accuracy, that strict *love of truth* for its own sake, which shuns all self-deceit and illusion, rejects mere appearance and fiction, and ever craves reality with an insatiable desire for it and sense of property in it. It carries the torch of conscience in the most hidden researches and in the depth of the inmost soul will be as stern and just as if before the gaze of the world or beneath the eye of God. It will never be content until it brings all knowledge into exact agreement with reality. At length, over and above these qualities, must be ranked that supreme passion, the *love of reason*, which seeks for the causes of things as well as for the mere knowledge of them, and for the harmonies of truth no less than for truth itself. Let these virtues be combined in a logical effort to bring order, unity, and system among the jarring sciences, and we have those strictly intellectual traits which are most typical of the true philosopher as well as

those primary qualifications most needed in the present state of philosophy.

A second group of the philosophic virtues is higher in the moral scale and involves more of a moral element. Were man a mere disembodied intelligence, wholly free from the passions and infirmities of mortals, the intellectual faculties alone might suffice him in the search for wisdom. Now and then, indeed, such an intelligence may seem to have appeared among men in a St. Thomas Aquinas or a Bishop Butler, alighting upon our orb, like Raphael in paradise, to discourse to us in the language of pure reason. But the angels of the schools have been few and their visits far between. The purest saints alike with the greatest sages have shown their need of certain moral traits in the use of the mental powers. Chief among such traits is that *intellectual purity*, which Bacon calls the lucid understanding or dry light of the mind as yet unstained by the prismatic hues of the passions. It is the organ of knowledge in normal exercise, neither swerved by pride, impatience, timidity, and self-seeking; nor clouded with anger, envy and malice; nor bewildered through the senses and the fancy; nor clogged with conceit and vanity. When fully attained, it would leave the mind reflecting reality like a flawless mirror, seizing knowledge as with direct intuition, and pursuing wisdom with unselfish devotion. Akin to such purity is that *intellectual candor* which the soundest understanding needs to exercise in dealing with persons and opinions. It would discharge the mind of all prejudice as well as passion, and not think to impose upon others deceits which it dare not practice upon itself. In controversy it would be as frank and fair as a knight on the field of honor. When solving difficult problems or doubtful questions it would take both sides into view, give to every scruple its place and weight, and not be content until it has swept the whole field of doubt, though it seem to stake its own system or its very creed upon the issue. Could it prevail, truth would never be worsted by logic, knowledge would rest only upon reason, and wisdom would have none but sincere followers. Born of this noble quality is that *intellectual catholicity* which candid souls easily learn to practice. It is the mind shaking

itself loose from all creeds and systems and rising above all sects and parties that it may survey them without passion, prejudice, or partiality. It knows that none of them has the whole truth, that each of them has some fragment of truth more or less alloyed with error and that all of them sifted together must yield the sum of truth now attainable by man. With large hospitality it welcomes within the intellectual precincts every reasonable hypothesis, every credible dogma, while it still respects the oldest theories and most homely doctrines. Could it reign amid the present anarchy of opinions and interests, science would lose its narrowness, religion would have no bigotry, and the oneness of truth would be realized in the fulness of knowledge. Purity, candor, catholicity, these are three cardinal virtues of the philosopher in his ethical relations; three moral requirements for the reform of philosophy itself at this juncture. Without them the votary of wisdom will not even be admitted to her shrine; for want of them she has already fled as well from the sects as from the schools; by means of them alone can she ever be wooed back again.

And hence the remaining and highest discipline of the philosophic mind must be in the religious region and through the religious sentiments. It is not meant here to assert any original sin or essential depravity in the understanding itself, such as may be found in the will and the affections. Call it a disease, a defect, a mere immaturity in its development; say even that as an instrument of cognition it is normal and perfect; the fact remains that somehow it has grown wayward in the great quest for truth. Amid a wilderness of error it is itself bewildered. An unfallen, an angelic intellect in such a plight might need divine guidance. The greatest philosophers, in fact, have shown their need of it, either perverting their mental powers for lack of it or developing them by means of it. Moreover, if true philosophy embraces religion and science in its scope as connected provinces, it is plain that it requires for its pursuit not merely on its empirical side the scientific virtues already named, but also on its metaphysical side, in some form and degree, what may be called the religious graces. It requires such graces urgently at a

crisis in human thought when they have become not less widely ignored than are they needed. And it requires them eminently in some thoughtful circles where it is the fashion to depreciate their philosophical value.

The first of these graces is a *rational humility.* Not the mere blind self-degradation which penitents are sometimes thought to practice, but that intelligent recognition by the intellect of its own finitude and limitations, which is in itself but a supreme act of intelligence, and that rational subordination of the finite reason to the Infinite Reason as revealed in nature and scripture, which is itself most reasonable. Even the great masters of physical science have shown this becoming temper, entering the kingdom of nature as we are bidden to enter the kingdom of grace, like little children. Their docile study of facts, their lowly estimate of the little known in comparison with the great unknown, their prostrate reason before infinite mysteries, are not only admirable as mere personal traits, but to be ranked among the conditions of their success, without which they could have been neither so wise nor good. And there is still more need of such dispositions within the metaphysical realm of inquiry. When dealing with essences and causes, especially that essence of essences and cause of causes called God, we are in contact with divine mysteries more overawing than any grandeurs of material nature. To approach them with due reverence or fear of Jehovah is but the beginning of wisdom, the first lesson in philosophy. Without it, the greatest sage becomes less than a child among the primal secrets of the universe. By rational sequence as well as judicial reserve, the grand metaphysical realities have been hidden from sophists and scoffers and revealed unto babes in knowledge and culture. In our own time, whilst devout and unsophisticated minds become deeply versed in things hidden within the bosom of God from the beginning, more speculative intellects have dared to treat such mysteries as mere godless abstractions, have coolly assumed the Absolute Ego or Infinite Reason or Primordial Will as a mere term of logic, and flippantly mimicked creation itself with their own flimsy dialectic. Though within the very skirts of the divine glory they have not liked

to retain God in their knowledge. And no wonder that they have but reeled blinded from the veil which they so rashly plucked aside. Professing themselves wise they have become fools. Their course of atheistic and pantheistic systems has been a mere round of self-destroying errors, an ever learning but never coming to the knowledge of the truth. And their impious monuments of metaphysic thought and lore remain as the scandal of philosophy no less than religion.

Second only to a philosophic humility is the grace of a *rational faith.* Mere crude belief without knowledge is but superstition; simple trust is often described as an act of piety; but intellectual assent to evidence, an enlightened conviction founded upon reason, though itself above reason, is one of the highest acts of philosophy. All science proceeds upon such faith; upon faith in our own faculties of cognition, upon faith in the order of nature, and ultimately upon faith in God as the author of the one and the upholder of the other. But for such faith, the whole fabric of human knowledge would soon dissolve like a dream. Even in physical science, we thus believe in order that we may know; and in metaphysical science through a like faith we may know the otherwise unknowable. We may know revealed realities on evidence which they bring with themselves, which has increased through thousands of years and which is as certain as that supporting other knowledge. To ignore such evidence and put mere speculation in place of an attested revelation is to hold a taper to the sun and stumble at noonday. The marvel as well as the condemnation is, that light has come into the world and men love darkness rather than light. With their back upon twenty Christian centuries, trained metaphysicians are groping like heathen sages, if haply they might feel after God and find him. Under the meridian light of a Christian revelation, amid great Christian schools and churches, renowned thinkers are reërecting the Athenian altar to the Unknown God, and inviting mankind to worship they know not what, an Inconceivable Mystery, an Absolute Contradiction, an Infinite Absurdity. Is it any more a righteous decree than a natural process which brings them strong delusion thus to believe a lie? Having destroyed the very grounds of

57048

rational belief, is it strange that they now offer us an agnostic religion of humanity, worshipping the creature more than the Creator, as well as an agnostic science based in conscious illusion? There can be no knowledge which does not rest upon faith, and the lack of a true faith to-day is undermining the very foundations of all our philosophy.

Born of philosophic faith comes at length the crowning grace of a *rational hope.* Inasmuch as the material of faith becomes material of knowledge, while the universe is infinite and God eternal, there can never be a time when knowledge shall cease. The expectation of such ever-growing knowledge is as reasonable as the desire of it is unquenchable. It draws its precedent from the progress already made in ages past, and it finds its pledge in problems unfolding through ages to come. Pascal likens it to an immortal youth, ever learning never forgetting from generation to generation. Already the vision of seers and sages is becoming fulfilled in the wonders of our own era. Never before was knowledge so increased. Never before was the prospect so grand and inspiring. And yet from the heights of such hope the pessimistic thought of the age is plunging toward unbelief and despair. In the midst of Christian culture it is quailing into pagan satire and heathen apathy. At the noon of time it is sounding the knell of science itself. As the last word of speculation, it is proclaiming nature an abortive paradox; man a self-mockery; glory, pleasure, art, learning, virtue, sheer illusions; and life itself but a nightmare of death and hell. Without God, it is thus without hope in the world. Only by a divine faith can this horrid spell be broken. Only through a heavenly wisdom will the emancipated reason of man be charmed away towards pure and perfect knowledge.

The Vision of Perfect Knowledge.

Behold now as in a vision the genius of philosophy like a strong and comely youth, sitting manacled and chained to a tomb in which is naught but a little heap of dust, and

whereon is written, VANITY. And a faded wreath is dropping by his side from his fingers; at his feet lies a goblet with the wine drained out; and though a manly strength is in his limbs, yet he appears worn and sorrowful. And behind him scarcely seen for the gloom are two dismal shapes which are the demons of the tomb and keepers of the gates of hell.

But the youth looks upward, and with knit brow and strained muscle essays to break away from his chain. And suddenly it grows light about him, and the Demons of Unbelief and Despair have vanished. And there come towards him two shining ones, which are the daughters of God. And she that is on the right has a wreath of ivy clinging about her forehead, a cross clasped to her breast, and her eye lifted toward heaven; and she that is on the left has the iris round about her head and her eyes full of tears, but a sweet sad smile lingering in her face. And as the youth gives his hand to the Angel of Faith she is glad and grows bold, while presently the Angel of Hope gives her hand to him, and weeps for joy. And immediately the chains fall off from his limbs; and the tomb is seen no more; and all clad in white he is led forward by the two angels into a path which is narrow and rugged but ends afar off in a portal full of light.

And now they behold flying towards them out of the heavens a strong and beautiful seraph which is the Angel of Knowledge and eldest of the children of Jehovah. He has the amaranth bound upon his brow, and wears the mystic eye upon his breastplate and a strength as of eagles is in his wings. And as they fly forward he hovers before them in a circle of light and waves toward the youth a laurel which seems always within reach but can never be grasped.

And when they come to the portal, the path beyond it grows brighter and brighter, as it rises higher and higher, until the eye cannot follow it for the distance and the brightness. And there the two angels disappear like morning clouds in the glory of the portal; but the seraph stands with limbs nerved and wings plumed as if for flight; and, waving the laurel, still beckons onward, onward.

And now the things which that man beholds it were not lawful to utter; for he is a spirit, out of the body, and sees with that eye with which we are seen. And while he speeds onward the worlds and the ages fly past him as in a vision. He lives a thousand years; but it seems to him only as a day. And again he lives a thousand years and sees the earth grow old and drop like a ripe flower among the stars; but it is to him only as a tale that is told. And then he lives thousands of thousands of years, and beholds world after world blossoming into the choicest ideals of the Creator; but he looks back upon it as one looks back upon what happened when he was a child. And still the endless space is beyond him, sown thick with a seed of worlds, and dust of stars.

At length, after a time of times which no man can number, he stands upon what seems the uttermost bound of creation; beneath him are all the worlds of immensity having at last given up their secrets and behind him are all the ages of eternity having at last unfolded their marvels; and nought but God remains as the ever knowable yet ever unknown. But while he yet gazes the vision dissolves as when a dream is forgotten, for a new universe has been born out of the old. And now, as if an insect should have grown into a man, the orbs have become to him but as atoms, and the ages but as moments, and the heaven of heavens is opening beyond him, as he treads the star dust beneath him. And still that which has been is to be but the beginning of that which shall be.

And thus he ever moves onward, onward, onward, through the immensities and the eternities, with birth after birth into life beyond life, ever nearing but never reaching the fulness of the great All-in-All, until the eye grows blind with watching him, and as a star fades into the sun he is forever lost in light.

PART FIRST.

PHILOSOPHY

AS THE

SCIENCE OF THE SCIENCES.

CHAPTER I.

THE PURIFICATION OF THE SCIENCES.

As heretofore defined, the ultimate philosophy is that complete science of the sciences and arts, which is to be reached inductively by the collective intelligence of mankind working through successive generations with a logical as well as historical evolution which already involves centuries of growing proof in support of revealed religion no less than of positive science and which ever tends towards one homogeneous body of truth for the divine glory and human welfare.

This Science of the Sciences, in its largest and fullest sense, embraces both the Art of the Sciences, and the Science of the Arts, neither of which could be complete without it and each of which proceeds with it toward completion. But in a stricter sense it treats of the cognitive theory of the sciences as distinguished from their logical processes and practical applications and is like any special science, viewed objectively as a mass of phenomena to be investigated and explained. In this latter sense it now comes before us as the first of the three general divisions of philosophy.

The process of forming such a Science of the Sciences begins with their purification. Before we can proceed to survey them historically, or intelligently to frame a theory of their origin and tendency, we must have freed them from all their corrupting admixtures and false connections by exposing their sources of error, by defining their true contents and limits, by grouping them in distinct classes, and by fixing their normal order in a philosophical scheme or system. And this work will be found important as a practical reform

in the sciences themselves no less than as a preliminary task of philosophy.

The need of some such rectification of the sciences is apparent on the very first view of that human intellect which is their source and instrument. Aside from all its moral perversions, its essential weakness is the trite lesson which we read in its manifold derangements; in the vacant face of idiocy, in the struggling look of palsy, in the wrenched features of madness, in the worn countenance of melancholy. And even when not thus folded in defective organ or warped by sorrow, it begins its normal growth in the oblivion of infancy, creeps slowly toward mature understanding through long years of experience, and at length reaches its largest knowledge only to learn its larger ignorance. "I seem to myself," said Newton, "like a little child that has gathered here and there but a few pebbles on the shore of infinite truth."

If we turn from individual minds to their combined action, we only behold such weakness magnified and multiplied. To say nothing of any original sinfulness, history appears full of a vast intellectual insanity; of monster births of reason binding the masses in brute ignorance; of distorted truths figuring in brilliant fables; of epidemic errors, tainting whole countries and successive generations; and of calamitous wrecks of all learning followed by wasting periods of superstition. And even so far as freed from such disease or aberration, the sane development of the collective intelligence of mankind has been slow and feeble. It first appears emerging from a remote antiquity of savage ignorance; it has taken a long course of centuries in unfolding the toilsome inductive method which marks its present advancement; and it has at last found its most lucid science fading into sheer nescience. The latest and highest wisdom of our epoch is but to know the ever knowable as also the ever unknowable.

And now, after six thousand years of errant philosophy, the resulting state of the sciences is still but a medley of truth and error. Immense masses of knowledge appear as mere fragments of whole continents yet unknown. And these fragments instead of being pure science, are found

mixed with mere theories still unproved and crude hypotheses themselves in conflict. And these theories and hypotheses are overlaid with scripture doctrines not yet clearly defined, and church dogmas still involved in contradiction. The wrangle of the sects is mingled with the jargon of the schools in every field of research. And the very increase of research has only brought with it new speculations and vaster problems to be added to the tangled deposits of former generations. It has thus become the first need of true science, to be freed from corrupting influences and unscientific ingredients.

In a strict sense, the purification of the sciences must ever keep pace with their progress, will but mark the degree of their advancement, and could only cease in their ideal refinement as pure omniscience itself. But meanwhile to every generation it still comes as a fresh task to search for their perennial springs of error, to cleanse them from new accretions, and digest them into a purer system. Accordingly, as we shall see, at each chief epoch of learning, the work of expurgation has been going forward from the days of Aristotle until the time of Bacon, who was perhaps greater in the Herculean feat of a destructive reformer of the sciences than in the more constructive tasks of philosophy. By his demolishing blows it was that the compact fallacies, conceits, and superstitions of twenty centuries were laid in ruins, and since then we have been merely clearing away the rubbish, laying the broad foundations and gathering the needed materials for the temple of knowledge. It will therefore be a fit preliminary study to review this part of his great instauration, as well to learn what progress has been made as to see what hindrances still remain.

SECTION I.

Sources of Error in the Sciences.

According to Bacon, there are four chief sources of error in the sciences, to be figuratively termed idols or illusive images; the idols of the tribe (*idola tribus*), the idols of the

den (*idola specus*), the idols of the market (*idola fori*), and the idols of the theatre (*idola theatri*). And these capital fallacies, though fully unmasked in his day, will be found ever reappearing under new guises in our time, like mocking spectres, often chased away, but still returning to haunt the schools and infest the sciences, until the full dawn of the latter day.

The *Idols of the Tribe* are those universal illusions of the whole race of mankind which inhere in the human intellect itself as in a distorting mirror that can only reflect the surrounding universe in dim and broken images. Of such fallacies the first is that spirit of system which leads the mind to impose its own prim method upon the boundless variety of nature, as if it were but a garden-plot of perfect curves and even numbers. Another is that power of prejudice which impels it to cull facts and instances to suit its own preconceived opinions, as in proving omens, dreams, visions and presentiments. Another is that familiarity with appearances which blinds it to realities, as in the phenomenal motion of the heavens around the earth by which mankind was deceived for ages. Another is that impatience of limits which ever hurries it into impotent speculations about endless time, space and number. Another is that proneness to abstraction by which it hastily generalizes its own notions of physical facts into universal laws. Another is that interference of the passions which tinges the dry light of pure intelligence with the false hues of a pride that rejects the truths it does not like, of an impatience that will not brook the difficulties of research, of a hope that runs beyond the sobriety of nature, of a fear that shrinks from the mysteries of being, of a conceit that scorns common objects and experiments, of a timidity in espousing paradoxes and of other mere feelings and motives that may secretly vitiate the understanding. And finally, above all these illusions is that incompetency of the senses which, though armed with the microscope and the telescope, can never reach to the invisible atoms and inconceivable worlds around us. These are the innate universal deceits from which no man could wholly escape without divesting himself somewhat of his very humanity.

The *Idols of the Den* are those more personal illusions which are peculiar to each individual, whose temperament, education, pursuit, circumstances, may shut him from the light of nature as in a little cavern filled with the phantoms of his own brain. One person will devote himself wholly to physical researches; another, to metaphysical inquiries; another, to theological pursuits; and each becomes alike narrow and one-sided. Conservative minds are enamored of the opinions of the ancients; while progressive minds are more fascinated by those of the moderns; and both will contend less for the discovery of truth, than for the triumph of a faction. There is an analytic mind which clings to particulars and facts, and there is a synthetical mind which flies off to generalities and abstractions, when neither can rightly be separated from the other. And thus it happens that while all men are more or less misled by the common understanding, each man may be specially deluded by some eccentricity or idiosyncrasy from which he cannot utterly free himself without destroying his very individuality.

The *Idols of the Market* are those verbal illusions which arise in the busy commerce of ideas among both the populace and the learned. Words are at first the mere ghosts of things, expressing only their vague impressions and appearances; and when on closer acquaintance with things, new technical terms are invented, these are either names of fictitious entities, like "chance," "the prime mover," the "vital principle," or such names of real essences, qualities and actions as lose their meaning and value with deeper knowledge and the need of more precise definitions. And hence the sciences become clogged with masses of decaying verbiage and are ever agitated by logomachies that end in no substantial conquests of truth.

The *Idols of the Theatre* are those traditional illusions which have been produced by the sects and schools of false philosophy, coming and going upon the stage of the world as in a mere visionary simulation of nature and reality. These are three-fold: the sophistic, based upon reasoning and speculation, like the logic and metaphysic of Aristotle; the empiric, based upon a few observations and experiments, like

the physics of Democritus and Heraclitus; and the superstitious, based upon pretended revelations as seen in Pythagoras and Plato and even in some modern theosophists who would derive natural science from Genesis and the Book of Job. These compact, systematized fallacies, like well-planned dramas, impose upon the human mind by their semblance to truth and either enter the sciences with a dogmatism that subdues and restrains them or with a scepticism that secretly undermines them.

Such was that masterly analysis of scientific error which Bacon gave to the world three centuries ago. A glimpse of it is enough to show its accuracy and completeness. Time has only vindicated and illustrated it. We are still surrounded with examples of all the four classes of illusions. How inveterate are the idols of the tribe as we still see them in the endless systematizations, the prejudiced inquiries, the rash generalizations, the crude conjectures, the subtle conceits, the idle speculations, which abound in every field of research! How dominant are the idols of the den in our modern civilians and divines, physicists and metaphysicians, antiquarians and reformers, thinkers and inventors, and countless other specialists secluded in their several pursuits, as in shadowy dungeons, each with his own fancies! What nimble idols of the forum are current in such glib terms as ether, molecule, protoplasm, noumenon, and such wordy disputes as spiritualism and materialism, idealism and realism, agnosticism and anthropomorphism! And what imposing idols of the theatre have held the stage of recent philosophy in the sophistic systems of Fichte and Hegel, the theosophistic systems of Schelling and Swedenborg, the empiric systems of Comte and Spencer, following each other amid the plaudits of admiring disciples! With but a change of scene and actors, the human mind would seem, at first sight, to have been doomed to the same phantasmagoria of errors from one generation to another.

And yet it would be a great mistake to infer that no advance has been made in the purification of the sciences during the last three centuries. If the first two springs of corruption, being innate, must ever be active, yet the other

two, being more artificial, have become modified in their action, and all four of them have been more or less restrained and corrected. This was due primarily, so far at least as didactic remedies could reach such evils, to Bacon's own eloquent refutation of them. Not only did he expose the fallacious structure of the general and individual intellect as never before had been done, but he dispelled the verbose logic of his time and assailed the false philosophical systems then dominant, by showing that they were born in the later schools of the Greek sophists, that they grew up in a crude age of the world, that they had yielded no useful inventions and arts, that they ever ran in circles without progress, that they were disparaged by their own votaries and already falling to pieces through internal disputes and dissensions despite the authority of Aristotle. And thus the way was opened for the inductive method which he taught and which has since in practice been the chief purifying agency in the sciences as well as the main-spring of their advancement. Brought back by that method into the school of nature the errant mind of man has there been checked, controlled and guided; its fancies, conceits and passions, have been subordinated to observed facts; its prejudices and superstitions have vanished through familiarity with natural processes; and its propensity to excessive system and generalization has been kept within the bounds of ascertained laws and proved theories. At the same time, and under the same training, its erratic action in abnormal constitutions, specialized pursuits, and narrow circumstances has been restrained and compensated by the growing general intelligence. And the result is, that the whole nomenclature of science, expressing things rather than thoughts, has become more exact and serviceable, and the traditional false philosophies, being discredited by modern research, are losing their charm and prestige or giving place to others which aim to be more in accordance with universal nature no less than with human reason.

In order to see what immense progress has already been made, we need only compare the present state of the sciences with their condition as described by Bacon. Nearly every obstacle against which he declaimed has disappeared. Out

of the twenty-five centuries preceding him, he could choose but six which had been at all favorable to science; two at the Grecian epoch; two at the Roman, and two at the Mediæval; but to these have since been added three later centuries more fertile in science than all previous centuries combined. Even in those favorable epochs he could find but little real science; the Greeks having neglected it for metaphysics, the Romans for ethics and politics, and the Schoolmen for theology; but it is the boast of our epoch that positive science is fast outrunning both theology and metaphysics. Up to his day the quest of Science had been the chance amusement of some monk in his cell, or some nobleman in his villa; whilst in our day it has become an independent pursuit and profession crowded with eager followers. In his time, the true end of Science was not seen, and it was perverted by the artizan to mere gain and fame, or used by the teacher simply to embellish his lectures; whilst in our day it is pursued by the self-sacrificing votary for its own sake as well as for the promotion of the useful arts and inventions. Then, the true method of science was unknown, and the investigator began by citing traditional opinions in confirmation of his views, or he reasoned from assumed principles in a vicious logic, or he resorted to only a few chance experiments; now, he begins with stores of observed facts, thence proceeds to the discovery of their laws, and only at last seeks to climb to their ultimate causes. Then, too, the dignity of all Science was not yet felt, and the dry details and gross processes of nature were deemed unworthy of sincere study or elegant discourse; but now, whole lives and illustrated volumes are devoted to such material objects as fossils, and bugs, and monsters, and diseases. That reverence for antiquity, authority and unanimity, which once debarred the very way to Science, has since been giving way to unbounded freedom of research and unrestrained license and novelty of opinion. That false admiration of a little science, which once delighted in a few simple manufactures, feats of magic and childish inventions may now be exchanged for a just wonder at the marvels of the museum and the laboratory, the microscope and the spectroscope, the telegraph and the photograph.

Instead of pedantic professors and mercenary charlatans as the only representatives of science, we now have the heroes of discovery and the martyrs of research. In spite of the academic conservatism of learning and letters, we have lived to see endowed colleges of science, and great national associations for its accumulation and diffusion among men. The bigoted and superstitious divines who once assailed science, are more than matched by the sceptical and infidel scientists who are now attacking religion. And the toiling monks of science, so far from being left as formerly without adequate rewards and honors, are winning the chief prizes of life and even becoming the idols of the people and the favorites of fashion, to be pensioned and knighted by kings and at length entombed among nobles, warriors and poets, as the benefactors of mankind. Last of all, that general despair of any progress in the sciences which had become chronic in the human mind, has vanished before their actual achievements into a well-grounded faith and unbounded hope of their future advancement.

As a reformer of Science Bacon thus led the way in removing its illusions and impediments, but still more as the prophet of a new era of science, did he utter glowing predictions which have been more than fulfilled. Beginning with divine Providence and inspired prophecy, he looked for the increase of knowledge with the circuit of the globe; and we have lived to see it traversed with the rail-car and steam-ship and girdled as with telegraphic thought. Proceeding next to the past errors of science he announced their remedies as he had before exposed their causes; and those remedies have been fully tested in a closer alliance of reason with experience; in a thorough purging of empirical science from false logic, theology and metaphysics; in a fresh unsophisticated study of the most despised facts; in disinterested experiments aimed only at the discovery of truth; in a more copious natural history or digest of different classes of phenomena, already forming a vast scientific literature; in a more systematic and universal application of the inductive method and consequently in ever increasing discoveries of the special and general laws of nature. Besides these high grounds of hope,

he found good auguries in the discoveries already made through mere accident or instinct as fortunate hits or shrewd guesses; and these have been followed in our day, as he anticipated, by other still more wonderful inventions due to methodical research into such agencies as heat, light, sound, and electricity. Another reason for hope he sought in the antecedent improbability of most discoveries, such as gunpowder, silk and the compass, which before his time would have been simply ridiculed as impossible and visionary; and accordingly we now have the great oceanic telegraph that a hundred years ago would have been deemed more incredible than a voyage to the moon, spectroscopic revelations of the heavenly worlds that would have been classed with the fabled glimpses of Olympus, and illuminated cities that would have seemed like the New Jerusalem that had no need of the sun, nor of the moon, nor of any candle. Still further did he hope for greater proficiency in the inventive genius which adroitly combines and applies known principles as in the art of printing; and such hope we see fulfilled in the steam-press, the cotton-gin, the sewing-machine and countless other contrivances which have made our own national patent-office one of the wonders of the world. Lastly, he foretold the greatest progress to ensue through a more direct devotion to strict science of that time, wealth and genius which had hitherto been spent in fruitless study and learning; and in answer to such prediction, the world has experienced a general revival of scientific enthusiasm; has witnessed the growth of whole sciences, which did not exist in his day, and has seen savage continents, then scarcely known, becoming subdued and civilized as by magic.

In like manner, on the same grounds of hope, and with the same just prescience, we may now look forward to a still greater progress of the sciences in the future. Let the work of cleansing them from inherent and traditional fallacies simply go on with more thoroughness; let strict inductive methods of research prevail, not only in the physical sciences, but also in the mental and social sciences, as Bacon himself anticipated; let all the sciences as fast as they advance become more systematically applied in the arts, ethical as

well as physical, and let the arts themselves be organized for practice with increasing capital as well as decreasing waste of labor and skill; let great industrial armies, drilled in the interest of civilization, steadily displace the destructive warfare which is already but the last dreaded resort of diplomacy; let wider charities and missions continue to lift all classes, nations and races into higher life and culture; in a word, let science become purified by true religion, and religion irradiated with pure science, and at length the matured intellect of man must stand forth disenthralled, triumphant, and crowned in its destined lordship of the earth with a power and glory that shall make all our present boasted sciences and arts seem but the prattle and playthings of its childhood.

Returning to the actual condition of the sciences, we must pass on to that part of their general purification which is logical rather than moral and intellectual in its nature. If we may suppose them to have been measurably freed from such errors as have been described, there might still remain in them certain of their adjuncts and products, which are misplaced and confusing, and from which they must be strictly distinguished and separated in order that we may have them in a pure state as proper data arranged for philosophical study.

SECTION II.

Definition of the Sciences.

In the task of defining the sciences, we need to start with some general definition of science itself; not a strict and full definition, such as might be grasped only by few minds, after much thought, but a leading conception easily applied to the received body of scientific knowledge.

It should be premised that three words will hereafter be used in unfolding the whole definition; knowledge, cognition, science. The first is a popular term signifying any acquaintance with fact. In common knowledge we simply know, it may be, half consciously and even unreasonably. The

second is a metaphysical term, implying a conscious self or a subject knowing with an object known. In cognition we become conscious of our knowledge, and know that we know, however crudely and vaguely. The third is a philosophical term, involving the two others. In science we become certain of our knowledge, and know what we know, both consciously and reasonably. Leaving these distinctions to appear as we proceed, let us begin with the first which is also the original meaning of the word science.

Science, in its primary sense, is knowledge. As such it is based upon facts, which are the real stuff of knowledge, and differs from faith and from fancy, which do not always involve facts or may involve error and fiction with them. We may believe or imagine what does not exist, but we can be said to know only what actually is; and often, therefore, our faith and fancy yield to our knowledge. Men, for example, have believed that the planets were gods and goddesses, or have imagined them forecasting our fortunes; but astrolatry and astrology do not belong to that portion of real knowledge termed astronomy. It is not meant by these distinctions to depreciate religion and poetry or to deny that both may not consist with science, but simply to exclude elements which, however important in themselves, are foreign to the conception of pure science or exact knowledge.

Science, then, in one of its simplest and most distinctive senses, is exact knowledge. And yet all exact knowledge is not science. There is an animal instinct, or a human sagacity which, within limits, is precise and certain without being scientific. The unreasoning bee, with a subtle insight, builds and stores its cells upon mechanical and chemical principles; and the untaught sailor as a practiced observer has a weather-wisdom which puzzles the meteorologist. Yet such intuitive intelligence, whatever it be, does not constitute the reasoned and approved knowledge passing under the names of chemistry and physics. The intuitive faculty is, indeed, active in all knowledge, and in gifted scientists, like Kepler and Newton, sometimes leaps to results which other minds might reach only by reasoning or experiment. But not until the brilliant conjecture has been tested as a working hypothesis

and moulded into a theory embracing all the relevant facts will it be accepted as verified knowledge.

Science, therefore, is verified as well as exact knowledge. And there is also in it a certain generality or system. The observed facts, which it includes, appear grouped under their laws or uniformities of coexistence and succession; and the testing theories which it uses, bring out the hidden order and unity of the most varied phenomena. If there be a popular wisdom, a traditional acquaintance with many natural laws and causes, which has become condensed in the arts and in sage maxims; yet these are mere fragments and vague masses of the more systematic bodies of knowledge which are found in the physical and some of the mental and social sciences. The genius of the artist, the skill of the artisan, the cures of the physician, the craft of the statesman, the eloquence of the divine, though working marvels before our eyes, have in them often a mere unreasoned knowledge which they can neither impart nor explain. In order to acquire the full scientific character, the laws upon which such crude experience proceeds and the theories which it involves must be ascertained and logically organized into a system.

Science, when thus defined as exact, verified and systematic knowledge, has still other high qualities. The first is its power of revision and prevision, of looking backward as in geology, from a present to a past condition of things ages ago, and of looking forward, as in astronomy, to their future condition ages to come, and thus predicting what will take place throughout nature under given circumstances. Even in meteorology, the science which deals with the proverbially fickle and confused phenomena of the weather, this predictive power is beginning to assert itself; whilst in social science, it is already claimed that history affords a sure inductive basis on which to project the normal course of nations and races under ascertained conditions. Prevision, indeed, is the test and the measure of all science. It distinguishes actual knowledge from mere conjecture, and yields an ever-growing certitute, gained in one science after another, with each experiment performed, each discovery achieved, each theory becoming fulfilled, each province of research

newly occupied, until the whole universe seems embraced as in one boundless field of prophetic vision. Plants and animals buried millions of years ago live before us again; planets and stars hidden millions of miles away are opened to our view; and we almost study the birth and growth of worlds as easily as we watch the flowers at our feet.

Another high quality of science is its essential immutability or persistence amid all earthly vicissitudes, changing opinions and institutions. Viewed strictly as real knowledge, it lives on through all lands and ages, ever the same in kind, however increased in degree. It defies the power of kings, the pride of castes, and the anathemas of priests. It survives with martyr-like faith the attacks of persecution; it casts off even the conceits of its own votaries; it breaks down the densest popular ignorance, and at length wins its way to a world-wide and lasting homage. Nations may rise and fall; civilizations may flourish and decline; old religions may fall off and pass away; new philosophies may have their little hour of applause; but true science continues unchanged, the same to Newton as to Euclid, in America as in Europe, through all the generations of men. Mathematics and astronomy have persisted amid the empires of Egypt, Assyria, Greece and Rome, the speculations of the ancient, mediæval and modern schools, the civilizations of Asia, Africa and Europe, and to-day are as true on the coast of the Pacific as thousands of years ago on the shores of the Mediterranean. Nor is it conceivable that such portions of strict science could ever be affected by any earthly changes, except so far as they might fade from human memory.

Still another high quality of science is its disinterestedness, or absolute freedom from human passion and prejudice. Hobbes has sarcastically said that men do not dispute axioms because such truths allow no room for the play of their feelings and interests: and Bacon, as we have seen, speaks of the dry light of pure intelligence as freed from any trace of pride, fear, impatience, or selfishness. Real knowledge ever presents facts which cannot be ignored, resisted or gainsaid, but must be simply accepted, whether we like them or not, even though they cross our opinions

and destroy our hopes. It is thus that Science becomes in the view of her votaries as impassive as nature, as impartial as fate; and ever trains them in their researches to suppress their feelings, to moderate their aims, to curb their fancy, to lay aside their preconceptions, to reserve their judgment, and only to seek knowledge for its own sake rather than for its uses, often without the hope of gain or fame, sometimes even at the risk or cost of all that they hold most dear. And hence there have been martyrs of science who for her sake have endured the dungeon, the rack and stake, and died calmly avowing their assured knowledge amid surrounding ignorance and bigotry. There have been heroes of science who to gather her hidden riches have braved the frozen pole and the torrid wild, the ocean depth and the mountain height, or in hospitals and laboratories have offered their own bodies as for deadly experiment in her service. There have been monks of science, anchorites amid all the luxury of modern civilization, toiling night and day to add some grains of truth to her increasing store. There have been very saints of science, so pure and passionless, so free from human taint, that with her smile they have become indifferent to all other praise or blame; that at her bidding, they have even recanted their most cherished opinions; that in her behalf they have appealed to God against the blindness of men and the ravages of time. And the world, at length won by such examples of true unselfish zeal for knowledge, has ever after sought to make them radiant and immortal.

The consequent dignity of science is felt by all her followers. Some of them may indeed seem to be unworthily seeking knowledge from sordid motives or to be ignominiously engaged in trivial and even gross researches. To the common mind their higher aims may not always be apparent, and their enthusiasm for insects and fossils and formulas and statistics may be deemed somewhat contemptible. But it is forgotten that in the view of an infinite intelligence, the reptile and the archangel might dwindle into a common insignificance, and that the meanest things may become grand when studied as essential parts of a universal system. The true man of science learns to see nature everywhere irra-

diated with order and beauty, to climb through the most insignificant facts to the most magnificent principles, and to embrace in his expanding vision all the worlds through all the ages. And as he pursues his researches he comes into high communion with like-minded explorers in other lands and times, and joins them in solving problems which might task the most seraphic intellect. In his loftiest mood, he may at length reverently ascend into the most hidden wisdom of the Creator, trace as it were the very logic of the creation, and become playmate of the laws which govern the universe. So may he even illustrate that divine image in which he was made, as but a little lower than the angels and crowned with glory and honor.

The essential utility of science no longer needs to be vindicated. Time was indeed when it had but few eulogists and was deemed scarcely more than a mere pastime of the learned and plaything of princes or was only misrepresented to the populace by the magician and the charlatan. And still the masses care less for its abstract processes and pure results than for its practical fruits and trophies. They may almost despise the philosopher, whose books are more praised than read, and they may sometimes pity the scientist who only plays with facts in his laboratory; but when the dull treatise and amusing experiment have somehow knit together whole communities, nations, continents in instantaneous thought, they learn how to value the speculations of a Bacon, the discoveries of a Henry and the inventions of a Morse. Mathematics, mechanics, physics, chemistry, as taught in colleges and accumulated in academies of science, may appear to be mere stores of useless knowledge. It is the beneficial results of such sciences as applied in the corresponding arts of navigation, engineering, architecture, mining, agriculture; in the steamer plowing the pathless ocean like a tamed leviathan; in the hewn oak and molten metal wrought into swift vehicles of transportation by field and flood; in the rock, clay and timber flowering into cities with bridges, temples, statues; in deserts reclaimed and made productive and beautiful; it is, in a word, in a new world of art springing up out of the old world of nature,

that we behold science coming as the nurse of industry and angel of blessing to pour the horn of plenty at the feet of the humblest son of toil in the land. Even the most abstract psychical sciences, ethics, æsthetics, economics, politics, still too little valued, are yielding foretastes of the moral and social beneficence which will crown their more mature development. And the time may yet come when philosophy itself, as the very Science of Science, now scarcely thus known, shall have converted the indifference of the practical scientist as well as the scorn of the multitude into grateful homage.

Besides all these essential elements and accruing qualities of science, it has two important features which the philosophic student of its phenomena should bear in mind from the outset of this inquiry. The first is its social production by the collective intelligence, as distinguished from the individual intelligence. Though portions of it may be mastered by a few select minds, yet no single mind could embrace its whole process or overtake its ever-growing product. As it stands before us to-day it is a vast accumulation of knowledge, produced by many laborers in many lands through many generations, sometimes working together, often working apart, always leaving their work unfinished for succeeding laborers to resume and carry forward by further researches toward still grander results. The physical sciences have thus grown up in history during thousands of years, astronomy from astrology, physics from magic, chemistry from alchemy, and still involve unsolved problems which may task posterity through an indefinite future. The mental and social sciences are emerging with a like fruitful promise in widening fields of inquiry. A life-time might be spent in the merest nook of any one of these sciences. And the philosophic student of them cannot therefore hope to master all of them, much less to evolve them from his own inner consciousness, but must simply accept and survey them as he finds them with their existing contents, and seek to combine them in their true relations without prejudice and without partiality.

The other feature of science, which should here be noticed,

is its essential unity amid artificial divisions. Because its vast field has become portioned among so many laborers for their convenience, it does not follow that such partitions inhere in facts themselves or in a real knowledge of those facts. Since nature is one, science must also be one. As all phenomena, when traced, will be found actually connected, so the sciences in which phenomena are parcelled and labelled will become logically related. And throughout this investigation we shall need to keep in view their fundamental unity, whilst occupied with their superficial divisions, made necessary or useful by the vastness of nature and the weakness of man.

Having now thus defined science in its oneness as exact, verified, systematic knowledge, we may next proceed to the particular portions of such knowledge, termed the sciences. And our first effort will be to carefully exclude from them certain of their adjuncts and products which are often mixed and confounded with them, but which should not be admitted into a strictly philosophic study of them.

In the first place, it is important that the sciences should be distinguished from the various branches of mere *Learning*, which is but the vehicle and ornament of science. The languages and literatures of different nations, as mastered by the scholar, may contain and propagate a vast amount of scientific knowledge and may embellish it for popular use; but viewed apart from their content and purport, they cannot themselves assume a scientific form until they have been made the proper subject of philology, or linguistic science, and the related sciences that deal with the origin and growth of dialects, races and arts. History, too, though susceptible of a scientific character, is often treated as a branch of literature or rhetoric, properly termed historiography. But if our former definitions be correct, mere Letters should not be classed as sciences.

In the second place, the sciences should still further be distinguished from the disciplinal *Studies*, which are but the instruments and processes of science. In the trivium of the schools, Grammar, Rhetoric, and Logic were termed the three arts of discourse, and have ever been valued as a training and

equipment of the intellectual powers, more than for any positive knowledge which they involve. Logic as the science of thought, is simply a branch of psychology, while, as the art of reasoning, it may properly prescribe the various methods of scientific investigation. Mathematics also is a pure science of ideas and ideal relations, rather than of observed facts and laws, until it becomes mixed with the real sciences, when it appears as a higher kind of applied logic, the sciences becoming exact in proportion as they can be made to assume a mathematical expression. And Metaphysics, the science of existence, as we shall see further on, is rather a species or general division of science than one of the sciences themselves, while as a dialectical study it serves to discipline the powers of abstraction, generalization and comparison, which are needed in them all. But such mere Studies or Disciplines are not, strictly speaking, sciences.

In the third place, the Sciences should also be distinguished from the *Arts*, which are but the applications and aids of Science. The industrial Arts, such as Navigation, Engineering, Metallurgy, Agriculture, Manufactures, are sometimes loosely called practical sciences, or bread-and-butter sciences, because pursued for a livelihood, rather than for the increase of pure knowledge; and this discrimination is justified by the fact that they were for ages practiced, and may still be practiced by the mere artisan, without much acquaintance with the mechanical and chemical sciences to which they are related and upon which their greatest advancement depends. The æsthetical arts, such as Architecture, Sculpture, Painting, Music, Oratory, Poetry, do indeed aim at the beautiful rather than the useful, but they have been mastered by some of the greatest artists, not only in advance, but in ignorance of the corresponding physical and mental sciences whose business it is to evolve the principles that are involved in every work of art and product of the imagination. And even the ethical arts, such as the learned professions of Law, Medicine, and Divinity, though they pre-suppose a liberal education in all the sciences, and require the highest moral aims in the practitioner, cannot claim the properly scientific spirit and character, inasmuch as they simply apply knowledge, rather than

accumulate it for its own sake. All such mere Arts, therefore, should not be confounded with the Sciences.

In the fourth place, all the other sciences may finally be distinguished from *Philosophy*, which is at once the science and the art of the sciences. That much abused word is indeed used in various senses. Sometimes it is restricted to psychology, or mental science, in distinction from all physical science. Sometimes it is confounded with metaphysics, as when we speak of the philosophy of nature or the philosophy of religion. Sometimes it traverses both psychology and metaphysics, as when we speak of the idealistic philosophy, the realistic philosophy, the transcendental philosophy. Sometimes it is made equivalent to logic, as when we speak of the inductive philosophy, or the philosophy of the inductive sciences. Sometimes it becomes a name for science in general, with its various divisions or groups of special sciences, as when we speak of natural philosophy as including physics, chemistry, biology; of mental philosophy as including psychology, ethics, æsthetics; of political philosophy as including economics, politics, sociology; of religious philosophy as including natural theology, revealed religion, the science of religions. Each of these senses of the word is more or less clear and legitimate, and all of them may be consistently included in philosophy as that one comprehensive *scientia scientiarum*, which must embrace both physics and metaphysics, together with the mathematics and logic which are employed in their construction. In this full meaning of the term, philosophy may be said to contain the whole of the sciences, while no one of the sciences, not even theology, can be said to contain the whole of philosophy. Also, though it be in itself preëminently Science rather than Art, yet it incidentally involves logic as the art of constructing the sciences. As thus defined, philosophy may be distinguished without being detached from the sciences, all of which it includes, and held aloft as that ultimate, supreme science, which seeks their historical and logical laws and aims at a theory and art of perfect knowledge. As we advance, these distinctions will be made plainer than as yet they may have appeared.

We can now clear away the adventitious matters which

we have been describing and throw them together outside our field of inquiry. The following table exhibits some examples of those mere appliances and applications of science which are commonly mixed with the sciences, and more or less confounded with them, but which should be rigorously excluded from a philosophic study of their phenomena.

APPLIANCES OF SCIENCE.

Letters.	*Studies.*
English Literature.	Grammar.
Continental "	Rhetoric.
Classical "	Logic.
Oriental "	Mathematics.

APPLICATIONS OF SCIENCE.

Industrial Arts.	*Æsthetical Arts.*	*Ethical Arts.*
Navigation.	Painting.	Law.
Agriculture.	Music.	Medicine.
Metallurgy.	Sculpture.	Divinity.
Manufactures.	Architecture.	Pedagogics.

It need scarcely be said that we are not disparaging the various branches of literature, the scholastic studies, and the practical arts, by thus distinguishing them and excluding them from the positive sciences. In the scheme of an encyclopedia it would be right to include all the former with the latter; letters, studies and arts, with the sciences; and in the scale of a curriculum it might even be proper to place some of the former higher than the latter, according as they were to be pursued in a school of letters, or in a school of the arts, or in a professional school of law, or of medicine, or of divinity. But in a school of pure science or of philosophy as embracing the pure sciences, they would necessarily take a lower rank and subsidiary relation.

The question of the relative worth and dignity of human pursuits is not here before us; nor, indeed, could that question predetermine abstract truth and knowledge. All that we now seek is to fix the sense in which words are to be used, by insisting that in a philosophical scheme of the sciences we should include only those bodies of ascertained knowl-

edge which remain distinct and peculiar, though they may have been expressed in elegant literature, applied in the useful arts, constructed by means of the disciplinal studies, and at length logically organized in philosophy.

Having thus defined the sciences, both by the method of exclusion and of inclusion, and set them before us as classifiable objects, we may now proceed to the task of their orderly arrangement.

SECTION III.

Classification of the Sciences.

In one of the comedies of Molière, the philosopher is represented as becoming furious at the soldier for daring to call the profession of arms a science, instead of an art; and at another time, as posed in a quandary whether he should put hats in the category of figures or of fashions. So early had a passion for excessive classification become the butt of even dramatic satire.

And yet, that the subject has its grave as well as its comic side, is shown by the fact that classifications of the arts and sciences have gone on multiplying in spite of repeated failures and a general incredulity, and that some of the greatest minds in modern times have been exercised upon the problem. There never was, in truth, more need of a right classification than at the present moment. As mere mental and social phenomena, the masses of human knowledge have become too vast and complex to be advantageously treated without some method and arrangement; while as intellectual pursuits they are so logically connected and interwoven, that no one of them can be intelligently cultivated without regard to the rest. Indeed, the ascertainment of the true normal order of the sciences is not merely a crying want in literature and in education, but is an essential part of the structure of science itself, without which it cannot be matured and completed. "The several sciences," said Bacon, "can as little grow apart as branches severed from a common tree." And, accordingly, the most noteworthy attempts to supply this want have

come of late from scientific thinkers and philosophers rather than from professional teachers and encyclopædists.

It is plain, however, that the classification now demanded must be something more than a mere artificial arrangement suggested by convenience and taste, and including only the superficial resemblances of one science with another. It must be real and essential, inhering in the sciences themselves, reflecting their actual relations and mutual dependencies, and exhibiting them as members of a logical organism, rather than as mere gradual studies in a curriculum or alphabetical topics in a cyclopædia. And it must have acquired such scientific exactness and value that at length it shall be universally adopted to the exclusion of all other methods. In a word, it must be philosophical rather than pedagogical or encyclopediacal. It may be long before we shall see such a classification in use, but the time has at least come to offer schemes for consideration.

It would be a mistake to assume that such schemes must proceed from a mere pedantic love of method and system, and can be of no practical use and influence. Some of the worst evils of modern scientific controversy arise from the want of a lucid order on the part of otherwise clear and vigorous thinkers who have treated the sciences as mere *disjecta membra*, or through conceit and prejudice have forced them into false, confusing relations, which could not but lead to collision and conflict. The current disputes in respect to protoplasm, evolution, and agnosticism, are examples. And such evils are likely to continue until the bounds of the sciences have been rigorously defined, and their normal ranks and connections become so fixed and accepted, that border feuds and trespasses will no longer be possible. Nor should we forget the positive benefits which may accrue, not merely to learned societies, educational institutions and libraries, but to pure science itself, when we have ascertained the limits which separate our knowledge from our ignorance, and ensured a more economical division of labor among the investigators at work in different fields of research. The classification of sciences, according to Whewell, has its chief use in pointing out to us the extent of our powers of arriving at

truth, and the analogies which obtain between the certain and lucid portions of knowledge and those other moral, political, and metaphysical portions which are not so advanced and perfect. Comte anticipated that a true gradation of the sciences, when in actual use, would regenerate education, both general and scientific; and Mr. Herbert Spencer agrees with him in thinking that through education it would have an immense effect upon civilization.

At the same time it would be very unwise to slight the difficulties of this important question. These are partly inherent in the vastness of its scope, and the multiplicity of its details; but they have also been greatly aggravated by the vague, conflicting senses in which scientific terms are employed. The problem, as stated by Comte, is to choose the one rational order out of a host of possible systems, as many as seven hundred and twenty being alternative to the one which he himself selected. "The difficulty of defining intimately connected studies," says Humboldt, "has been increased, because for centuries it has been customary to designate various branches of empirical knowledge by terms which admit either of too wide or too limited a definition of the ideas which they were intended to convey, and are, besides, objectionable from having had a different signification in those classical languages of antiquity from which they have been borrowed." The words physics, history, and philosophy, for example, have lost much of their original meaning, and become current in the most various senses. And to this difficulty, it should be added, that the ground is already pre-occupied not merely with conspicuous failures in classification, but with more or less useful schemes of science, which have become traditional through long usage, and even illustrious by the great names associated with them.

If we recur to the history of the sciences we shall find that their classification has varied with the advancement of exact knowledge, as well as with the caprices and fashions of philosophers. At one time, whole sciences have been wanting in the scheme, merely because as yet they were unknown; at another time, well known sciences have been ignored or depreciated through some reigning prejudice; and at no time,

until quite recently, have they been arranged with any approach to a philosophical order or from a strictly scientific motive. Indeed, such order as did obtain among them, was often implied rather than expressed, and can now be discerned only in the light of modern distinctions. The study of these obsolete schemes is more curious than useful, except so far as we can trace in them the gradual development of a philosophical system. This has been attempted by the author in his essay on "The Order of the Sciences," published in 1882. Professor Robert Flint, of Edinburgh, has since treated the bibliography of the subject with exhaustive learning and great critical skill, affording some further examples of the classificatory principles in that essay as here produced.

The ancient classification could not but be vague and meagre. Among the early Greeks, after the mystical mathematics of Pythagoras, there would seem to have existed little more than a sort of crude speculative physics until the time of Socrates, who added the elements of logic and ethics. Plato then wrought the existing mass of knowledge into the first comprehensive system, embracing in his dialectic a general science of cognition, within which he included the special provinces of physics and ethics. Aristotle followed with his more precise delineation of logic as the organon or instrument of the sciences, which, by a masterly arrangement that has dominated the schools for centuries, he grouped into three great divisions, the Theoretical, the Practical, the Technical; the first including mathematics, physics, and metaphysics (primary philosophy or theology); the second including ethics, economics, and politics; and the third including technics, poetics, and rhetoric; theology as the head of the metaphysical realm being queen of the theoretical sciences, as the theoretical are themselves paramount to the practical and the technical.

THE ARISTOTELIAN CLASSIFICATION.

Theoretical Philosophy.	*Practical Philosophy.*	*Productive Philosophy.*
Physics.	Ethics.	Poetics.
Mathematics.	Economics.	Rhetoric.
Metaphysics.	Politics.	The Arts.

The Stoics, whilst observing these divisions, rearranged them on the principle that virtue is superior to knowledge, by subordinating theoretical to practical science, making logic, as well as rhetoric, ancillary to ethics, and merging theology in physics as a science of efficient and final causes. The Epicureans, still further depreciating theoretical science, restricted logic to a search for the ethical canons of a happy life, placed physics before ethics, and banished theology even from physics as wholly mythical and misleading. And at length the Sceptics completed the debasement of pure science by involving it in a paradoxical logic and making it the highest aim of ethics to abstain from scientific inquiry.

Among the Romans, as little was added to the order as to the content of the sciences, Cicero in his philosophical writings having simply marshalled them in a rhetorical eclecticism, and the elder Pliny having industriously packed them away in his Natural History without any pretence of scientific method. There may have been an exception in the learned Varro, the first encyclopedist, whose five hundred works embraced the whole round of philosophy, and whose lost treatise on the disciplinal arts or studies is said to have laid the foundation of the whole mediæval system of education.

If the Greek and Roman classification be termed more or less philosophical in its tendency, that which followed it in the Christian centuries became theological, ecclesiastical and scholastic. The Jewish and Christian schools of Alexandria by a mystical theory of knowledge annexed the new domain of revealed theology to the ancient empire of Grecian philosophy. The Church fathers, with the exception of St. Augustine, whilst restoring theology to her lost kingdom of metaphysics, depreciated and neglected the other sciences, though signs of a different tendency at length appeared in the didactic works which led to the formation of the time-honored scheme of the seven liberal arts and sciences, as the age of barbarism declined. Martianus Capella, a learned Latin of the fifth century, though not a confessed Christian, had treated of the seven liberal arts in his "Satyricon," a sort of cyclopedic allegory celebrating the nuptials of Mercury and Philology as attended with the seven bridesmaids, Gram-

mar, Dialectic, Rhetoric, Geometry, Arithmetic, Astronomy and Music. The great Roman civilian Boethius, who illustrated the virtues as well as the consolations of the Antonine philosophy, had also discoursed of the same arts in works which became manuals in the schools. The more Christian statesman Cassiodorus, in the monastery which he founded, seems to have been the first to recommend them as helps to divinity, grouping the three arts, Grammar, Dialectic and Rhetoric, as formal sciences that deal with words and the four disciplines, Geometry, Arithmetic, Astronomy and Music, as real sciences that deal with things. Isidore of Seville and the venerable Bede of Durham embodied them in compends which were as lights in a dark age. At length Alcuin, the preceptor of Charlemagne and founder of the great cloister-schools, authoritatively prescribed them as a preparatory course to the study of divinity, like the pedagogic by which Grecian and Roman youths formerly had been trained for the service of the state. Thenceforward the Trivium and Quadrivium, or three arts and four sciences, were claimed as the seven steps to divine wisdom. The great doctors Albertus, Duns Scotus, Thomas Aquinas, made them ancillary to Theology, as queen of all the sciences, both theoretical and practical, physical and metaphysical. The seraphic Bonaventura, in his treatise on the reduction of the sciences to Theology, derived all knowledge from divine illumination, and classed the natural sciences of physics, mathematics and metaphysics, the rational sciences of grammar, logic and rhetoric, and the moral sciences of ethics, economics and politics as but lesser luminaries of the Father of lights and only source of wisdom. And Dante, rapt in an imaginary heaven of science, saw in ascending order the seven planetary spheres of the seven liberal arts, grammar in the Moon, logic in Mercury, rhetoric in Venus, arithmetic in the Sun, music in Mars, geometry in Jupiter and astronomy in Saturn; next above the planets, the starry spheres of physics and metaphysics; still above the stars, the crystalline sphere of ethics; but high above and over all, the empyrean of pure divinity.

THE SCHOLASTIC CLASSIFICATION.

Trivium.	*Quadrivium.*	*Theology.*
Rhetoric,	Music,	Ethics,
Dialectic,	Astronomy,	Metaphysics,
Grammar.	Arithmetic,	Mathematics,
	Geometry.	Physics.

The scholastic classification had thus become a sort of dogmatic encyclopedism. The Aristotelian circle of the sciences was closed within the pale of the Church, and philosophy scarcely allowed a place outside the theological curriculum. A few exceptions were such enlightened doctors as Roger Bacon, who projected a scheme of universal knowledge in his Compendium of Philosophy; Vincent of Beauvais, whose Fourfold Mirror of History, Nature, Morals and Doctrine reflected the entire range of mediæval learning; and Gregory Reisch, whose Margarita Philosophica or Epitome of every kind of Science, constituted, according to Humboldt, the first great encyclopædia from which to date the modern attempts to classify the various branches of knowledge.

With the revival of letters the classification became more free and spontaneous. The study of the classics was removing the barbarous verbiage in which the sciences had been swathed for centuries, and restoring the ancient philosophic spirit. The renowned Pico came challenging Christendom as a champion of the "Omne Scibile" or knowable universe. Politianus, the great classical scholar, published his "Panepistemon," or tree of universal knowledge, in which the existing arts and sciences appeared as branches distinct from Theology. Nizolio, the philosophical reformer, in his "Anti-barbarus," treating of the false and useless in philosophy, assailed the scholastic logic, and anticipated Comte by exscinding metaphysics as a dead limb from the trunk of science. And Campanella, far ahead of his age, in his "Universal Philosophy," had glimpses of the divine foundations of the sciences in nature and revelation, as well as of their logical processes and metaphysical principles.

But it was not until the Reformation had fully liberated both religion and philosophy that Luther led forth the theological sciences, and Descartes led forth the metaphysical sciences, and Bacon led forth the physical sciences, like bold explorers, into widening fields of research with ever growing harvests of truth. The result is, that for three centuries the different groups of sciences, having become independent, not merely of theology, but of one another, have been contending over their boundaries, sometimes for dominion, sometimes for existence, the physical with the mental, both with the metaphysical, and at times all with the theological—like the rival European sovereignties which meanwhile were striving to maintain or extend their discovered possessions in the new world. But at length, with the complete map of the globe, we may begin to look for a complete map of science, and already attempt what Bacon finely calls "a general and faithful perambulation of learning, with an inquiry what parts thereof lie fresh and waste, and not improved by the industry of man."

It becomes evident from this glance at the history of the sciences, that the problem of their coördination belongs to an advanced period of their development, and can only be solved by the combined and successive attempts of many laborers. Each of the sciences must at least have found a name and a place in human estimation, in order that all the classifiable objects may be fully before us; and even then it would be the height of presumption and conceit to imagine that by one stroke of genius they could be marshalled into perfect order. Not only must we begin with an unprejudiced survey of the whole existing mass of scientific knowledge, but we must patiently examine the classifications of our predecessors, carefully weigh their merits and defects, cull out the sound principles which have survived their failures, and combine them with any we have to contribute, and then be content to regard our own favorite scheme as still but tentative and approximate—in short, we must pursue the same modest experimental method by which we arrive at all scientific truth. We shall do well to continually keep in mind the lesson which history plainly teaches, that it is only

in and by the progress of the sciences themselves that their true classification can be brought into view, and that all other classifications which we may seek to impose upon them, will be swept aside as antiquated rubbish, the mere scaffolding and waste material of a structure of which they could form no part.

In order to simplify the task of examining the countless classifications which have accumulated during the last three centuries, we need to begin by rejecting such schemes or kinds of classification as do not come within our strictly philosophical inquiry. By our previous definitions we are rid at the start of all that vast crude classification which mixes the sciences with the arts, studies and literatures, or digests them only from some motive of convenience. The geographical, historical, bibliothetic arrangement of them in manuals, annuals and compends; the alphabetical arrangement of them in dictionaries of the arts and sciences; and even the topical arrangement of them in the great encyclopædias, though useful in collecting and diffusing their results, do not exhibit them in their pure forms and true correlations. Nor can the philosophical character be claimed for such classification as has the higher motive of grouping them according to great interests which they may subserve. The mere worth of knowledge has predetermined many a scheme. In this spirit a religious classification was attempted by Comenius, the Moravian reformer, who dreamed of a "Pansophia," or universal wisdom, making all the sciences, like successive chambers, lead to theology as the shrine in the temple of knowledge, and who projected a grand pansophic university for the training of Christian youth. An academic classification was suggested by Leibnitz, who would arrange the sciences as books might be arranged in a university library for the use of the four faculties and the benefit of the learned professions. A strictly utilitarian classification was devised by Jeremy Bentham, whose "Chrestomathia," or scheme of useful knowledge, started from eudæmonics as a universal science of well-being, embracing the arts with the sciences in endless ramifications under pedantic titles unknown to any dictionary, Greek, Latin or English. A similar ethical

classification has since been proposed by the Italian Ferrarese, who grouped the sciences around anthropology, according as they serve to maintain man in health, to further his perfection or to prevent his degradation. An ecclesiastical classification was advocated by the eloquent Father Ventura, reviving the scholastic distribution into sciences of authority, sciences of reason, sciences of observation. Krug, while in the chair of Kant, admitted even a political element, classing the sciences as free or bound, according as they are more or less restrained by civil law and legislation. The "Pantology" of Roswell Park was a bibliographical classification designed to afford courses of reading in the arts and sciences. The "Order of Studies" by President Hill is a pedagogical classification for arranging the sciences in a curriculum. Professor W. D. Wilson has amended the Aristotelian classification by including among the productive sciences the modern arts conducive to beauty and utility. The æsthetical motive also figured largely in the genesis of the sciences unfolded by Pamphilis from the reciprocal interaction of man and nature. There is simply no end to the unphilosophical schemes based upon the mere superficial distinctions and external relations of the sciences. Whatever merit or use they may have elsewhere, they are foreign to our purpose here. Excluding them as far as possible, we must limit ourselves to such classifications as may claim to be more philosophical in their aim and purport.

Without attempting the excessive refinement of a classification of classifications, we shall find it important to observe that they are of two sorts, the subjective and the objective; those adjusted to our internal faculties, and those adjusted to external realities; those proceeding upon the order of ideas in man, and those proceeding upon the order of facts in nature.

The subjective tendency came first into the field. The sciences as human products were most easily referred to their human sources and elements. Chief among the modern examples of this method was the comprehensive scheme employed by Bacon in the "Advancement of Learning" and afterwards adopted by Dalembert in the celebrated French

Encyclopædia, and by Baron Bielfield, of Prussia, in his "Elements of Universal Erudition." It proceeded upon the psychological principle of adjusting the sciences to the mental faculties which severally produce them, and are the fountains of knowledge in the human mind; History relating to the memory, Poetry to the imagination, and Philosophy to the reason; the first division embracing Civil, Ecclesiastical, and Natural History with the Mechanic Arts; the second division (as amended by Dalembert) embracing Lyric, Epic, and Dramatic Poetry, with the Fine Arts; and the third division, embracing Natural Philosophy, both physical and metaphysical, Human Philosophy, both individual and social, and Divine Philosophy, or Theology, both natural and revealed.

THE BACONIAN CLASSIFICATION.

Memory.	Civil. Ecclesiastical. Natural.	History.	
Imagination.	Lyric. Epic. Dramatic.	Poetry.	
Reason.	Natural. Human. Divine.	Philosophy.	Physics. Metaphysics. — *Nature.* Ethics. Politics. — *Man.* Natural Theol. Revealed Theol. — *God.*

The beautiful symmetry displayed through all the numerous subdivisions of this scheme and its rhetorical convenience for an encyclopediacal treatment of the different branches of human learning have been often and justly praised, but as a strictly scientific arrangement of strictly scientific knowledge, it has been almost rendered obsolete by the advancement of modern science, as well as by the searching criticism to which it has been subjected. Dugald Stewart, in particular, in his preface to the "Encyclopædia Britannica" has shown that its analysis of the mental faculties is incomplete, as it does not include the powers of abstraction and generalization; that memory, imagination, and reason, instead of being always separately exercised, are often blended in intellectual pursuits; and that consequently in such an arrangement the sciences and arts are confused together under the same general titles,

as for example, metaphysics with astronomy, and the mechanic arts with civil history. As if to meet this objection, however, the Earl of Crawford, in his "Progression by Antagonism," admitted that no art or science is produced by the imagination alone or the reason alone, and referred the arts and letters only to imagination as predominant and the physical and metaphysical sciences only to reason as predominant, while the harmonious coöperation of the two faculties yields philosophy both speculative and practical. The Baconian principle also appears in the scheme of Melchior Peccanini, whose psychology embraced the intellect, the will and the æsthetic sense, with truth, goodness and beauty as their correspondent objects; the first faculty yielding the metaphysical and physical sciences; the second faculty the moral and political sciences; and the third æsthetics and the fine arts. As late as 1880, Professor Valdini has published a defensive "History of the Classification of Human Knowledge according to Francis Bacon."

Among the earlier French classifications should be put the psychological scheme of Destutt de Tracy, who would have unfolded the sciences, according to the principles of Locke and Condillac, from the sensations, the will, and the properties of external nature beyond the power of the will; the first group including ideology, grammar and logic as treating of the formation, expression and combination of ideas or sensations; the second group including economics, ethics and jurisprudence as involving volition; and the third group including physics, geometry and arithmetic as wholly external and natural; but excluding theology, which could have no place in his materialistic system.

The German classification has been largely psychological. Christian Wolff referred the sciences to the cognitive and the appetitive faculties, the former embracing ontology, cosmology, psychology and natural theology, and the latter embracing ethics, economics and politics, to which Baumgarten prefixed æsthetics. Consistently with his philosophy, Kant viewed all science as a mere subjective organism fed by experience with objective material, and would have developed the whole metaphysical group out of his "speculative reason"

as purely rational sciences, leaving the other group to flow out of his "practical reason" as mere empirical sciences. At this point logically, though not chronologically, comes the ingenious scheme of Schopenhauer, whose rational sciences consisted of mathematics and logic, while his empirical sciences were grouped as physical, organical and ethical, in accordance with his subtle doctrine of cause, stimuli and motive. Neither Fichte nor Schelling advanced beyond Kant toward the precise problem before us. This was reserved for the poet-philosopher, Coleridge, whose complicated scheme with some modifications was employed by the editors of the "Encyclopædia Metropolitana," with the view of more strictly separating the scientific from the literary and historical material of learning, and blending a philosophical with the usual alphabetical treatment of such topics. It was based upon the Kantian psychology; the Pure Sciences issuing from the pure reason and dealing only with the ideas and acts of the mind in itself, and the Mixed Sciences issuing from the sensuous understanding and dealing with observed phenomena, as combined with abstract principles; the former being subdivided (1) into the Formal Sciences, grammar, rhetoric, logic, and mathematics, and (2) the Real Sciences, metaphysics, ethics, and theology; and the latter being subdivided into (1) Experimental Sciences, such as mechanics, hydrostatics, optics, and (2) Applied Sciences,

THE COLERIDGIAN CLASSIFICATION.

The Pure Reason.	Formal.	Grammar.	Pure Sciences.
		Rhetoric.	
		Logic.	
		Mathematics.	
	Real.	Metaphysics.	
		Ethics.	
		Theology.	
The Understanding.	Experimental.	Mechanics.	Mixed Sciences.
		Hydrostatics.	
		Optics, etc.	
	Applied.	Useful Arts.	
		Fine Arts.	

or the useful and fine arts. The authors of this ingenious classification avowed high moral and didactic motives; but however serviceable it may have proved for their purpose, it

must be objected to it, as to the scheme of Bacon, that it involves psychological distinctions which are not sufficiently precise or generally accepted. In regard to all such schemes, indeed, it may be questioned whether psychology, even if it were perfected, would not be too narrow a basis for the whole superstructure of the sciences. There would seem to be no natural or essential connection among them, if they are to be separately conjoined with the different mental faculties which produce them, and thus artificially arranged as mere pursuits of the human intellect.

A more logical application of the subjective principle, also on the basis of the Kantian metaphysics, was afforded by Dr. Whewell in his comprehensive work on the "Philosophy of the Sciences." Instead of adjusting them to the mental faculties, he sought to arrange them in accordance with the fundamental ideas or conceptions upon which they proceed; mathematics proceeding upon the ideas of space, time, and number; mechanics upon the additional ideas of force and motion; chemistry upon the ideas of affinity and likeness; biology upon the ideas of life and final cause; psychology upon the ideas of emotion and thought; palætiological sciences upon the idea of historical cause; and natural theology upon the idea of the First Cause; each following science involving also the ideas of its predecessor.

THE CLASSIFICATION OF WHEWELL.

Mathematics.	Mechanics.	Chemistry.	Biology.
Space. Time. Number.	*Motion. Force.*	*Element. Likeness.*	*Life. Final Cause.*

Psychology.	Palætiology.	Natural Theology.
Emotion. Thought.	*Historical Cause.*	*The First Cause.*

In favor of this profound and beautiful arrangement, it may be urged that it is the result of an historical and philosophical study of the sciences themselves, pursued with wonderful breadth and acuteness of view; that it rigidly distinguishes the theoretical sciences from the practical arts; and that it exhibits them as concatenated in an intelligible, if not strictly logical order. Its defects are that it avowedly foregoes any complete classification of the mental and social sciences; that

it largely ignores the objective materials or facts of knowledge for the sake of the ideas that mould and combine them; and that it runs out into metaphysical questions, concerning which practical men of science are not likely to be soon agreed.

It has been wittily said of Whewell, that science was his forte and omniscience his foible; but the logical principle of his classification found its extravagant climax in another philosopher, whose fancied omniscience was based upon a scorn of real science. The encyclopædia of Hegel was consistently framed in accordance with his panlogistic philosophy. Assuming that whatever is, is rational, that even nature is but petrified logic, and dialectic the process of rethinking the whole thought of the Creator, he essayed by mere syllogistic reasoning, and without any aid from experience, to build up a purely ideal series of sciences; beginning with logic as the science of abstract thought, thence rising through the concrete notions successively emerging in the natural sciences, mechanics, physics, organics, and thence ascending through the more complex conceptions of the mental sciences, ethics, politics, and religion, towards the fulness of the absolute idea in philosophy, embracing thus the totality of existence, from zero to infinity, in one concatenated process.

Of this subtle and brilliant construction it may be said that it has proved at once the boast of the metaphysician and the scandal of the scientist. On the one hand, it is claimed as the most comprehensive scheme of human knowledge that has ever been devised, and one that all future research must verify, and it certainly is well adapted to the literary purposes of a complete encyclopædia. But, on the other hand, it sins against the first law of true science, by assuming that a preconceived order of thoughts in our minds must be identical with the actual order of things in nature, and then, at every step, so blends the metaphysical with the empirical realms of inquiry as to be practically worthless for any strictly scientific purpose. It may only serve to illustrate conclusively the risk and absurdity of attempting to arrange the sciences solely with reference to the human faculties or conceptions which they involve, with no regard to those external reali-

ties and relations upon which they are founded, and in accordance with which primarily they should be adjusted.

This general view has simply been confirmed by the Italian classification in its more speculative forms. The profound thinker, Antonio Rosmini, in his treatise on "The Origin of Ideas," referred all knowledge to the cognitive mind itself, and evolved his whole classification of the sciences from its three processes of intuition, perception and reasoning; the first group comprising ideology and logic and treating of the ideal; the second comprising psychology and cosmology and treating of the real; and the third comprising ontology and deontology, the former treating of the actual or things as they are, and the latter treating of the moral or things as they ought to be. Special deontology, as relating to the perfection of human beings, embraces such sciences as ethics, æsthetics, economics, politics, cosmopolitics.

THE ROSMINIAN CLASSIFICATION.

Intuition.	Ideology.		The Ideal Sciences.
	Logic.		
Perception.	Psychology.		The Real Sciences.
	Cosmology.		
Reasoning.	Ontology.	General Ontology.	
		Natural Theology.	
	Deontology.	Ethics.	The Moral Sciences.
		Æsthetics.	
		Economics.	
		Politics.	

In opposition to this scheme the great Italian patriot and thinker, Vincenzo Gioberti, in his "Introduction to the Study of Philosophy," took cognized being as his starting point and somewhat in the Hegelian manner traced his genesis of the sciences, first in ontology and theology, then in mathematics, logic, ethics; and at length in psychology, cosmology and the physical sciences. Both of these distinguished philosophers as devout Catholics allowed a place in their systems for the super-intelligible and super-rational, and their respective disciples, Di Giovanni, in his "Philosophia Prima," and Peyretti, in his "Philosophia Theoretica," have so amended their schemes as to include the revealed or divine sciences with the rational or purely human sciences. But the one fatal

flaw in these brilliant air-castles of the philosophic fancy is their lack of scientific content and validity. They are neither built upon the sciences themselves, nor upon the underlying facts which alone can sustain the sciences.

In passing now to the opposite principle of classification, we should observe that it is difficult to find a pure example of either method. Some of the examples already cited are not wholly wanting in the elements of a more natural and scientific arrangement. Bacon, in subdividing the sciences that proceed from the reason, grouped them in three great provinces of reality, nature, man, and God, as natural, human, and divine sciences; and Coleridge, even among his sciences of the pure reason, distinguished the real from the formal, while his mixed sciences, issuing from the understanding, were projected in the external world of phenomena. In like manner we shall see in the examples that are to follow, that the objective or empirical principle has not always been exclusively and consistently applied, and it will still be our task to sift the true from the false, until we get all the needed data for a final judgment.

The objective tendency has grown with the growth of the sciences, as fast as they became independent of subjective conceit and could be studied as social phenomena beyond individual control. The point of departure from Bacon was made by his cotemporary, Thomas Hobbes, in the "Leviathan," when he based knowledge upon facts and their consequences and divided philosophy into Natural and Civil, as conversant with bodies natural and bodies politic; these two divisions including all the existing sciences, except Theology which, in anticipation of Comte and Spencer, he excluded as unscientific and unknowable. The defects in this scheme as well as others in the scheme of Bacon, were met afterwards by Dugald Stewart when he suggested the two realms of Mind and Matter as chief divisions of philosophy, the former to include the Intellectual, Ethical and Political sciences and the latter the Mathematical and Natural Sciences. Without starting the metaphysical question between the spiritualist and the materialist, all parties will agree that physical and psychical phenomena, with their corresponding sciences, are

clearly distinguishable, and that among the latter are the historical facts of comparative theology or the science of religions. A further advance was made by Dr. Neil Arnott, in the introduction to his "Elements of Physics," when he arranged these two sets of sciences in a pyramidal series, rising from physics, through the chemical and organical sciences to the mental sciences, the latter including ethics and theology. And this serial principle was more fully elaborated by Patrick Edward Dove, whose acute and ingenious treatise "The Theory of Human Progression" was based upon the supposed order in which the connected sciences come to effect in correspondent arts. According to Dove, not only is the logical process in each science infallible, but the consecutive evolution of the sciences is so fixed and necessary that human beings in ten thousand different worlds could not unfold them in any other order than that in which they are being unfolded, first the mathematical, then the physical, next the chemical, at length the moral and social, the last including politics and theology; and his conclusion is that the hope of a moral millenium at the goal of the series may be based on scientific prevision, or what he calls the natural probability of a reign of justice in the earth. In the Scottish classification should also be included a principle broached by Sir William Hamilton in his "Lectures on Metaphysics," with reference to the kinds or degrees of cognition implied in phenomena, in their laws, and in their inferences or causes. He applied the principle somewhat vaguely and only to the mental sciences; phenomenological psychology, treating of the cognitions, feelings and volitions; nomological psychology, including logic, æsthetics and ethics; and inferential psychology, involving metaphysics, ontology and natural theology. But it is obvious that all the sciences might thus be grouped in classes or stages of crude, of exact, and of complete cognition. And it may yet be found that this simple arrangement of Hamilton has contained unconsciously the germ of a full organization of scientific knowledge.

Among the later Italian classifications, also, are some which proceed more or less fully upon the objective principle. Professor Carlo Cantoni, dividing the sciences according to

their cognitive process into the ideal and the experimental, would then distribute them according to their objective material into the metaphysical sciences of ontology, natural theology, cosmology; the physical sciences of mechanics, chemistry, natural history, mathematics; and the psychical sciences of logic, ethics, æsthetics, politics, pedagogics. Baldassare Labanca, seeking to include the whole range of objective truth throughout the ideal, real and social world in one universal philosophy, would trace its three corresponding branches as the speculative, the experimental, and the historical philosophy; the first embracing the metaphysical, mathematical, ethical, juridical, political and æsthetical sciences; the second embracing the physical, mechanical, chemical sciences; and the third embracing the linguistic, geographical, statistical and economical sciences. Similar schemes have been projected by Professors Conti and Simone Corleo and other Italian philosophers, noticed by Dr. Flint in his learned papers. To the same class also belongs the "Organism of the Sciences" sketched by the German philosopher, Benno Erdmann, who would group them in different series according to their elementary data; first a mathematical group of purely formal sciences; then a group of historico-mechanical sciences, involving real evolution, such as geology, organology, anthropology; and at last a group of historico-psychical sciences, not yet complete; metaphysic being retained as a discipline among the imperfect sciences, and theology retained with pedagogic among their applications to the practical interests of culture and progress. Of all the objective schemes thus far noticed, it is to be observed that they are scattered and irregular attempts in different countries at different periods, each of them marked by valuable classificatory principles, but holding them with more or less error and confusion.

The French classification seems to have steadily brought these principles together with that constructive and systematizing genius which distinguishes the French intellect in all fields of research. Descartes led the way with his aphorism, first broached in the physics of Aristotle, that our knowledge proceeds from things easily learned to those more difficult,

from the simple to the complex, from the general to the special; and a host of ingenious classifications followed. Prominent among them was the elaborate scheme of the celebrated physicist, André Ampère, bequeathed as his last scientific attainment. It was entitled a "Natural classification of all Human Knowledge," having resulted from an empirical study of the sciences themselves, and was based upon the classificatory principle by which naturalists arrange objects in kingdoms, genera, and species. The two most general divisions or kingdoms were the cosmological sciences of nature, and the noölogical sciences of mind. The former comprised the two sub-kingdoms of inanimate objects and animate objects. Each of these again branched into two sections, which were in their turn bisected, and this bifurcate division, which according to Ampère inheres in the nature of things was thus carried through six distinct orders of fact, in both the natural and the mental world, until as many as one hundred and twenty-eight sciences and arts had been enumerated, with appropriate technical names. The artificial

THE CLASSIFICATION OF AMPÈRE.

Cosmological Sciences.	Inorganic.	Mathematics, etc.	
		Physics,	Experim. Physics.
			Chemistry.
			Stereometry.
			Atomology.
	Organic.	Natural History, etc.	
		Medical Sciences, etc.	
Noölogical Sciences.	Philosophical, etc.		
	Moral Sciences.	Ethics.	Ethography, etc.
			Ethognosy, etc.
		Thelesiology.	Thelesiography, etc.
			Thelesignosy, etc.

symmetry and prolixity of this scheme, its cumbrous new-coined nomenclature, and its mixture of the arts with the sciences, would have been a bar to its adoption, as they may have been to a fair discussion of its merits. It contained, however, some valuable distinctions, which still figure in the most recent systems, and in particular, the principle upon which Ampère insisted, that the sciences ought not to be studied in vicious circles, one ever recurring into another, but according to the serial order in which he had tabulated

them. One of its adherents was the socialist, Proudhon, who in the sciences of the second order substituted a ternary for the quaternary division, and claimed to have applied it with mathematical rigor throughout the whole realm of phenomena.

A contemporary critic, Cournot, in an "Essay on the Foundations of the Sciences," endeavored to combine the principles of Bacon and Ampère in a scheme which was also professedly founded upon reality, both relative and absolute, and for the mental faculties substituted certain social temperaments or stages, through which human knowledge is supposed to have advanced in space and time, from its crude state in religion and art, towards the perfect scientific character. These gradations were termed History, Philosophy, and Science; the first embracing such subdivisions as geography and civil history; the second, such subdivisions as mythology and theology or metaphysics; and the third, the arts and theoretical sciences. The theoretical sciences were then arranged in a series, ascending from the simple to the complex, and comprising the mathematical, the physical, the biological, the noölogical, and the political sciences. Among the advocates of this system was Isidore Saint Hilaire, and the historical principle which it involved, though it complicated the tabular arrangement, was undoubtedly a step in the right direction.

It remained for Auguste Comte, a contemporary of Ampère and Cournot, to embody the merits of these systems with but few of their defects, in his acute and luminous treatise termed "The Philosophy of the Positive Sciences." Restricting science itself to an empirical study of facts and their laws, excluding theology and metaphysics as a mere unscientific search for causes, separating the positive sciences from the arts, and still further distinguishing the abstract from the concrete sciences, Comte then proceeded to arrange the abstract sciences, which he had thus obtained, according to the interdependent phenomena to which they refer, in the order of their decreasing generality and simplicity. All natural philosophy was first divided into inorganic physics and organic physics, corresponding to the two most general classes of phe-

nomena. The former was then subdivided into celestial physics or astronomy, both geometrical and mechanical, and terrestrial physics, both mechanical and chemical. Organic physics was also subdivided into biology, the science of organisms, both vegetal and animal, and sociology, the science of associated organisms, both animal and human. Five fundamental sciences were thus arranged, all of them physical or natural sciences. Psychology, as distinct from biology, was not allowed a place. But a sixth science, mathematics, the most abstract study of the simplest and most general of all facts, was made the foundation and source of the whole ascending series of sciences, as being itself independent of them, whilst all of them are more or less dependent upon it. Astronomy, the next in order, though directly dependent upon mathematics, is largely independent of terrestrial physics by reason of the greater generality and simplicity of its data, the heavens ever affecting the earth, but the earth scarcely affecting the heavens. Terrestrial physics, chemistry, biology, then follow in the scale of increasing dependence and complexity, until we reach the summit in social physics, where the phenomena become so mixed and multiform as hitherto to have defied scientific investigation.

THE COMTEAN HIERARCHY OF THE SCIENCES.

Organic Physics.	Sociology.
	Biology.
Inorganic Physics.	Chemistry.
	Terrestrial Physics.
	Astronomy.
	Mathematics.

In favor of this so-called hierarchy of the sciences, Comte ingeniously argued that it is the order which the sciences themselves have spontaneously assumed, as separately pursued, without any effort to arrange them; that it coincides with their actual historical succession, astronomy having long preceded the later-born sciences of physics and chemistry; and also that it verifies his own law of their intellectual evolution, from the theological through the metaphysical into the positive state of exact knowledge; mathematics and astronomy having already become the most positive of the

sciences, because most remotely connected with humanity and least exposed to the theological and metaphysical perversion, whilst biology and social physics, being in the thick of human passions and interests, are still enveloped in primitive superstition and mysticism. To these arguments, Comte added the practical consideration that his gradation of the sciences is the only logical order in which they can be successfully taught and studied in schools of general or scientific culture.

The fascinating simplicity of this scheme, its logical convenience, and the large amount of truth which it contains, caused it for a time to pass unchallenged in the scientific world, until at length it became the centre of a wide controversy among the leading philosophers of the age. The most varied views have been taken of its general principles and of its details. On the one side, Dr. Whewell, in defence of his own ideal scheme, resisted the attempt to banish metaphysics and theology from the realm of science, as not warranted by the history of physical discovery, and in itself a pedantic and capricious limitation of our knowledge, to which the intellect of man neither can nor should submit. Prof. Huxley, in his trenchant manner, remarked that metaphysics was with Comte a general term of offence for whatever he did not like, and that the sciences, instead of being like steps in a ladder, are but branches from the common stem of molecular physics. Mr. Herbert Spencer, in vindication of his own originality as well as in opposition to the whole Comtean classification, more directly assailed its distinctive principles, maintaining that its serial arrangement of the sciences, though requisite for literary purposes, has no basis either in nature or in history, since phenomena never occur logically, least of all in the supposed hierarchal order, and because the sciences have been simultaneous rather than successive in their progress; the simple depending upon the complex as well as the complex upon the simple; astronomy alone having owed at least ten important discoveries to the later physics and chemistry. Professor John Fiske, of Harvard, one of the most discriminating critics of the system, united with Mr. Spencer in showing that Comte had strangely

mixed up the abstract with the concrete sciences in his hierarchy; mathematics, physics, and chemistry with astronomy, biology, and sociology; and that the true historic order of their succession is spiral rather than linear, being not alone due to the relative generality of phenomena, but also and much more largely due to their relative conspicuousness, their frequency, their concreteness and the varying means of investigating them. While both critics were thus agreed in renouncing the serial principle as worthless, they further argued that the whole metaphysical region, which Comte had simply ignored, must in the nature of the case be unknowable.

On the other side of the debate appeared Mr. Lewes, whose "Biographical History of Philosophy" was written to prove that theology and metaphysics have for centuries been steadily retreating before the march of the Positive Philosophy, and who accepted "its luminous conception of a new and final classification of the sciences as evincing a gigantic force of philosophic thought." Professor Bain also virtually adopted it in his Logic. M. Littré, the most distinguished French disciple of Comte, besides defending the originality of his master from the attacks of the English critics, replied that the true normal order of the sciences may be observed in their constitutions, and still hold objectively in things in accordance with the increasing complexity of phenomena, howsoever it may be reversed and confused in our minds by the abstracting and generalizing faculties. Mr. John Stuart Mill, by far the ablest and most judicious exponent of the system, also stood with Littré for its defence, maintaining that at least it served its purpose as a logically convenient arrangement, and that it is historically true, not, indeed, that one of the sciences has been finished before another was begun, but that they have proceeded together towards perfection at unequal rates in the order of their difficulty, the simple ever in advance of the complex, though with mutual aid and acceleration; and moreover that the alleged mixture of the concrete with the abstract sciences is but a verbal objection, astronomy or celestial physics being an abstract as well as concrete science. The French and the English

defender of Comte were not only thus united in retaining the serial principle as essential, but also in abstaining from any metaphysical speculation as to the ultimate limits of knowledge.

As the outcome of this controversy we now have another classification, proposed by Mr. Spencer, and amended by Mr. Fisk, which in place of a linear series of ascending ranks, would substitute three collateral groups of sciences, one distinguishable from another according to the degree of their logical abstractness; the Abstract Sciences, the Abstract-Concrete Sciences, and the Concrete Sciences; the first to include sciences of ideal relations, viewed apart from all facts, such as logic and mathematics; the second to include sciences of real relations, implicated in certain classes of facts, such as mechanics, physics, and chemistry; and the third to include sciences of aggregated facts, involving both ideal and real relations, such as astronomy, geology, and biology.

THE SPENCERIAN CLASSIFICATION.

Abstract Sciences.	*Abstract-Concrete Sciences.*	*Concrete Sciences.*
		Astronomy.
	Mechanics.	Geology.
Logic.	Physics.	Biology.
Mathematics.	Chemistry.	Psychology.
		Sociology.

These groups, though not to be put in a serial order, are further defined as instrumental with respect to one another, the first with respect to the second and third, and the second with respect to the third only, while they furnish material to one another in an inverse order, the third to the second, and the second and third to the first. Each group of sciences, moreover, is to be divided into numerous sub-groups, on the same principle of logical abstractness and universality.

Mr. Fiske, in adopting the classification of Mr. Spencer, has condensed and re-stated it, so that the Abstract Sciences, dealing with relations that are qualitative and quantitative, shall include logic and mathematics; the Abstract-Concrete sciences, dealing with properties that are manifested in masses and molecules, shall include molar physics, molecular physics

and chemistry; and the Concrete Sciences, dealing with aggregates as actually exemplified in the heavens, in the earth, and in living organisms, shall include astronomy, geology, biology, psychology and sociology. Into each one of these five concrete sciences he would introduce a subdivision, referring to the evolution of phenomena from an ancient to a present condition; astrogeny, dealing with the genesis of the stellar and planetary systems; geogeny, dealing with the genesis of our globe; biogeny, dealing with the genesis of species; psycogeny, with the genesis of mental faculties and feelings; and sociogeny, with the genesis of moral and political institutions. Both of these distinguished thinkers were agreed in substituting for the linear procession of the sciences a complex spiral movement of combined analysis and synthesis, the concrete sciences ever reacting upon the abstract, and the abstract ever stimulating the concrete.

The elegance and perspicuity of this scheme have been justly praised, and as far as it goes, its general accuracy and logical serviceableness need not be questioned. But it has been incisively remarked by Mr. Stuart Mill, that it is an attempt to classify the sciences, not according to their subject matter or mutual relations, but according to an unimportant difference in the manner in which we come to know them; or, as Mr. Spencer himself expresses it, according to the order in which they may be built up in the human consciousness. In other words, it retains a shred of the vicious subjective method, upon which we have already animadverted, being to some extent an ideal arrangement, based upon our modes of knowing, rather than upon things known; and although as such, it may be true and useful, yet to marshal the sciences merely with reference to our logical convenience in cultivating them, would seem to be no more philosophical than to arrange them with reference to their ethical value, or their rhetorical symmetry, or their practical importance. Moreover, it should be observed that Mr. Fiske, whilst avowedly rejecting the serial principle, has implicitly re-admitted it into his group of concrete sciences, by adjusting them to the evolutionary succession of phenomena.

To these classifications may here be added several others

which mark a later speculation upon the subject. M. Renouvier, in his acute treatise, "Rational Psychology," rejects the Comtean hierarchy and reverts to the subjective principle, arranging the sciences in three groups; the logical, based upon the forms of the understanding, such as logic, grammar, mathematics; the physical, derived through sense and experiment, such as natural history, chemistry, biology; and the mixed logical and physical, not yet in a mature scientific form, such as æsthetics, ethics, politics. M. Bourdeau, in his "Theory of the Sciences," proceeding upon the objective principles of Comte, has projected a new series of sciences with new names and a greater elaboration of their respective methods. Logic is termed positive ontology, the science of realities, with the method of intuition; Mathematics is termed metrology, the science of magnitudes, with the method of deduction; Dynamics is termed theseology, the science of positions, with the method of observation; Physics is termed poiology, the science of modalities, with the method of experimentation; Chemistry is called craseology, the science of combinations, with the method of integration; Morphology is the science of forms, with the method of comparison; and Praxeology, the science of functions, with the method of connection. The Rev. H. M. Stanley, known as a philosophical writer, has some excellent observations on the "Classification of the Sciences" in the April number of *Mind* for 1884. He emphasizes the important distinction between the static and dynamic view of phenomena in each of the sciences, as suggested by Kant under the terms physiography and physiogeny, and largely used by Comte and Fiske. As to the order of the sciences he adopts the middle terms of the Comtean series, but superadds theology, and retains mathematics as concomitant with the sciences, and then most ingeniously unfolds the series on the principle of aggregation; chemistry as the science of atoms; molecular physics as the science of aggregated atoms or molecules; molar physics as the science of aggregated molecules or masses; biology as the science of aggregated cell masses; psychology as the science of the individual man; sociology as the science of human aggregates; and theology as the science of God,

somewhat vaguely designated an aggregate of aggregates in the view both of the pantheist and theist. As some of these valuable principles had already been maintained by the author in his previous essay, their discussion may be deferred to the proper place in this treatise.

After all that may be said in praise of these various schemes it is not likely that any of them will be accepted as complete and final; and the problem still remains, by a more careful analysis, to reject their discovered errors and combine their residual truths in some more philosophical system. But in approaching this difficult problem we need to repeat the lesson confirmed by its whole history, that all mere classification at best is artificial. As applied to the sciences in their crude state it cannot but detach, confuse and entangle them, according as its motive and process may fail to be strictly scientific. While its practical need and value are unquestionable, yet it must ever be held and used under correction by the progress of science itself, as a working hypothesis that may be superseded or modified. A perfect classification of the sciences could only come after and express a perfect system of the sciences. And hence it should be our first aim to ascertain that system as it exists among them rather than to impose a system upon them; not so much to classify them as to hold in check the classifying propensity, and let them arrange themselves without our interference, under the eye of a philosophic scrutiny and by a rigorous method. This is the task now before us.

SECTION IV.

The Philosophical Scheme of the Sciences.

A philosophical scheme of the sciences is one which shall exhibit them in their pure state and normal relations, as freed from the adventitious matters and false combinations more or less incident to all artificial classification. In seeking for such a scheme we shall pursue the method of successively enunciating its general principles and applying them, as far

as possible, to the existing state of scientific knowledge; premising that the full force of these principles will better appear from a combined view of them, than from a separate estimate of any one of them, and least of all, of the one first to be stated.

I. *A philosophical scheme of the sciences should be based upon the facts which support them, rather than upon the ideas which they involve.*

It is not meant that the most concrete sciences do not involve ideas and ideal relations, nor yet that the most abstract sciences may not be evolved from facts as actually connected, but simply, that inasmuch as facts afford the foundation and material of knowledge, the order of facts, if it can be ascertained, should be allowed to determine the order of the sciences which are built upon them. While there may be some truth and much convenience in ideal classifications, yet being ideal and not empirical, they may have been largely preconceived in advance of experience, and in using them we shall be in danger of imposing upon facts an artificial arrangement of our own which they will not bear, and thus driving the sciences into false and hurtful connections. But when we shall have discovered the distinctions and relations which actually obtain among facts, there will then be revealed to us the solid foundations upon which to begin to erect the whole superstructure of real knowledge.

A strict application of this principle would exclude the abstract sciences of Logic and Mathematics from a philosophical classification, and retain them as disciplinal studies, until by being employed in empirical investigations, they acquire a content of positive knowledge, when they simply become parts and processes of other more real sciences. And in this view of their aim and scope, the chief authorities have been agreed since the time of Aristotle, with the exception of the few German metaphysicians, such as Hegel and Oken, who have held that logic is the essential science of nature, and mathematics the original and substantial framework of the universe. Indeed, for the same reason, the whole distinction between the abstract and the concrete sciences, being one that is in our thoughts rather than in

things, may be disregarded, and the two condensed into a single series to be simply termed FUNDAMENTAL SCIENCES, based upon actual relations which obtain among facts. We proceed to complete a list of such sciences by the aid of the next principle.

II. *A philosophical scheme of the sciences should fully reflect all the distinct classes of facts which have been scientifically ascertained.*

As the important distinctions among facts do not lie patent on the face of nature, but are to be learned in the progress of science itself, it follows that the right classification of the sciences must proceed with their own development, as one set of phenomena after another is distinguished and subjected to scientific methods, until the circle of known and knowable facts is complete. And no classification can be complete which ignores any such group of phenomena. It would be unphilosophical to exclude a class of facts from mere dislike of them, or through some prejudice against investigating them, as it would be to include mere abstractions or notions for which one may have a fancy. The aim should be to admit every group of phenomena which nature presents for investigation, and which science has clearly brought into view as regulated by laws, even though those laws may not have been ascertained, and as yet seem scarcely ascertainable. For we are not to measure the uniformity of nature by the degree of precision in our knowledge of it; and history warns us that it would be rash to declare any class of facts too complex, remote, or recondite, to be ever mastered by the processes of science.

Applying this principle, we may begin with the general obvious distinction between material facts and mental facts, as affording ground for the two chief groups of the *physical* and *psychical* sciences. Let it be observed that this is not necessarily a metaphysical distinction. We here abstain from any inquiry into the essential nature of matter or mind. You may hold that they are two diverse substances, or that mind is a mere form of matter, or matter a mere form of mind, or both mere modes of some third inscrutable essence or force. In either or any case the distinction will still appear in phe-

nomena themselves, viewed apart from any deeper foundation which it may or may not have in the ontological region beneath them. And it is a distinction which has been so universally accepted that we cannot speak in any language without recognizing it, however little practical importance some may attach to it. When, therefore, Comte would have arbitrarily ignored this distinction, and merged the mental, moral, and political sciences in physics, he simply confused classes of facts, which are at least as distinguishable as mechanical from chemical, or chemical from vital phenomena. And in this attempt to obliterate a whole group of sciences, he has not by any means been followed by his own disciples, not even by those who take a materialistic view of mental processes, still less by such critics as Lewes and Spencer. Even Stuart Mill, though adopting the Comtean hierarchy, is careful to amend it by inserting psychology between biology and sociology, insisting that mental phenomena, with their laws already so largely ascertained, afford material for a distinct and independent science, however intimately connected it may be with the neighboring regions of physiology and sociology. But when he adds that with the prospective establishment of sociology among the sciences "the circle of human knowledge will be complete, and it can only thereafter receive further enlargement by perpetual expansion from within," he seems not to have observed or remembered that there is still another class of facts quite as distinct as mental or social facts, though largely implicated with them, and quite as susceptible, it may be, of scientific investigation. Indeed, a surmise of their scientific character may be said to have long ago appeared in certain philosophers having no professional interest in them, such as Machiavelli, St. Simon, Hume, who have sought to construct a natural history of religion. Mr. Mill himself has suggested, in his last work, that the doctrines of religion should be treated as scientific theorems, to be tested like any of the speculative conclusions of physical science. M. Emile Burnouf claims to have founded a science of religions upon comparative ethnology, with good hopes of determining the laws of their evolution. And we have the authority of a distinguished philologist, Professor

Max Müller, for retaining in this field of research the time-honored name of Theology, Comparative and Theoretic Theology. It is true, Professor Müller doubts whether the common classification of religions as natural and revealed will any longer serve the purposes of science; but that is a question partly empirical and partly metaphysical, which can only be settled by the proper scientific methods. Whatever views may be taken of the origin and essential basis of religious phenomena, whether or no the subjective and objective factors in their production are humanity and deity, the phenomena themselves cannot be questioned, both the new school of comparative theologians and the old school of professional divines being now agreed, though from different stand-points, in treating such phenomena scientifically. Nor can it be doubted that with the admission of theology among the empirical sciences, the only remaining class of facts is compassed, and the circle of human knowledge becomes complete.

In thus claiming for theology the last and highest place in the hierarchy of the sciences, the author is aware that before this claim had been put forth in his memoir in the Philosophical Society of Washington on "The Order of the Sciences," a certain vague preëminence had been assigned to theology on other grounds. His special aim has been to place it at the head of the Comtean series in genetic connection with the inferior sciences and there present it as the new science of religions which mythologists are pursuing quite apart from the serial sciences and more or less in opposition to the traditional divinity of the Christian church. Hereafter it will be brought into correlation with the revealed theology as also chief of the metaphysical sciences, and thus exhibited as supreme in the whole field of philosophy. As yet, however, we are dealing only with the empirical sciences as based upon the series of phenomena which they respectively include.

It appears, therefore, that the progress of science has brought into view six distinct classes of facts, affording ground for as many corresponding groups of fundamental sciences; the Physical, the Chemical, the Organical, the

Psychical, the Social and the Religious. Each of these groups will be found to have several divisions, more or less distinct, according to the degree of its advancement toward the perfect scientific character. Physical Science embraces Molar Physics or Mechanics, dealing with material masses at rest and in motion; and Molecular Physics, dealing with molecular undulations or ethereal vibrations of sound, heat, light, electricity and galvanism. Chemical Science embraces Inorganic Chemistry, dealing with the combination of atoms or elements in definite proportions; and Organic Chemistry, dealing with the recomposition of molecules in organized bodies. Organical or Biological Science embraces Botany, dealing with the different orders of plants, from the fungus up to the oak; and Zoölogy, dealing with the different orders of animals, from the mollusk up to man, the flower and head of organic nature, with his varied races, languages, and arts. Psychical Science embraces Psychical Statics, dealing with the nervous functions and mental faculties, the senses, the intellect and the will; and Psychical Dynamics, dealing with the laws of mental processes in sensation, thought and emotion. Social Science embraces Social Statics, dealing with the organization of individuals into the family, the state and the church; and Social Dynamics, dealing with the laws of social evolution from barbarism to civilization. Religious Science embraces Comparative Theology, dealing with the great ethnic and general religions; and Theoretic Theology, dealing with the development of essential or absolute religion.

It will be seen, by a glance at this scheme, that while the physical sciences have obtained a large degree of fulness and precision, the psychical sciences are still somewhat crude and indistinct; but the recent history of the latter already proves their analogy with the former. In mental science there has been a steady progress since the elder Mill began to formulate the laws of association among ideas. In social science, from the time of Vico, we have been growing familiar with the laws of historic recurrence and average progress, evolution through revolution, advanced individuals stimulating society, and advanced society still carrying forward individuals in ever ascending stages of civilization. And even in

religious science Bishop Butler long ago threw out the bold conjecture that the entire history of the Christian scheme of redemption, with all its miraculous phenomena, if viewed by an adequate intelligence, would appear as much regulated by general laws as the march of the seasons or the growth of a flower.

Assuming now these six fundamental sciences to rest upon as many distinct classes of facts, we find the actual connections of those classes of facts still to be considered. And to this problem may be applied our third principle.

III. *A philosophical scheme of the sciences should exhibit all the classes of facts in their actual connections as co-existent in space and successive in time.*

It need scarcely be said that the several classes of facts, as found in nature, are in a fixed order which is never reversed or confused. If their existing collocations and successions should be deranged; if, for example, the earth should be placed abruptly nearer the sun, or teem anew with primeval ferns and monsters, the present cosmos would simply collapse in chaos. We may, indeed, within narrow limits, modify the natural order of phenomena, and take a class of facts out of their due place in time, for the purposes of a scientific experiment; or, leaving the natural order undisturbed, we may confine our attention exclusively to one set of phenomena, without regard to others that precede and accompany it, in order to make our knowledge of it more exact and thorough. Indeed, the whole scientific procedure consists very largely and necessarily in such special and separate investigations. But nature itself is not the medley that our methods might make it, and does not present phenomena to us in detached fragments. Full knowledge of them must include their real associations as part of their reality; and in a philosophic scheme of the sciences, which is to be natural rather than artificial, real rather than ideal, we must not only lay the foundation in distinct classes of facts, but rear the whole superstructure in accordance with the actual connections of those classes of facts. In other words, we must deal with phenomena as we find them co-existing together in space and succeeding one another in time. And we may obviously

do this without any metaphysical inquiry into the relation of time and space to our cognitive faculty, by simply taking them as the two forms in which all phenomena are contained or presented.

Of spacial connections the most general and obvious is that between the heavens and the earth. While the progress of science has shown that celestial space as compared with terrestrial space is practically infinite, yet it has also shown that every class of facts disclosed in the heavens obeys the same laws which govern the corresponding class of facts displayed upon the earth, and that the advance of our knowledge is from the adjacent to the remote phenomena. As Mr. Spencer has otherwise expressed it: "Before mankind scientifically co-ordinated any one class of phenomena displayed in the heavens, they had previously co-ordinated a parallel class of phenomena displayed upon the surface of the earth." This at least is true of the more advanced physical sciences. Celestial physics is but an extensive application of terrestrial physics. The great mechanical laws which keep the planets in their orbits around the sun were first observed in the falling of an apple and the swinging of a chandelier; and though Stuart Mill could fancy that two and two may not appear equal to four among the inhabitants of the Dog-star, yet astronomers are showing us that the stars themselves behave with as much mathematical propriety as the angles and curves upon a slate. The waves of light and heat from the sun are the same as those from a candle.

In like manner, the new celestial chemistry is but a wonderful expansion of terrestrial chemistry. The meteoric stone dropped from a neighboring planet or from beyond the solar system brings no new substance into the laboratory; and the spectroscope is exhibiting the gases and metals of nebulæ, stars and galaxies as plainly as they may be seen in the products of the retort and the crucible. As the most difficult problems of solar mechanics can be wrought upon a black-board, so those of sidereal chemistry may be almost depicted upon a screen.

Even the organical sciences, as far as we now know them upon earth, are beginning to project sound analogies respect-

ing the physical and chemical conditions of life in other worlds, as exemplified in the clouds and seas of Venus, and the polar snows and continents of Mars, when contrasted with the gaseous nucleus of the comet or the extinct craters of the Moon. While some of the heavenly bodies seem wholly inorganic and incapable of the lowest forms of life, others almost reflect the geography of our own planet and are so highly organized and show so many of the surroundings of organic life as we know it, that a celestial biology becomes no more improbable than once was the celestial chemistry.

And if the kingdom of the physical sciences has already been made to embrace all celestial as well as terrestrial provinces, is it wholly unreasonable to look for a like expansion of the psychical sciences? The objections to such an expectation are in fact popular rather than philosophical, and all in the face of scientific precedent and analogy. "No biologist," says Lewes, "would listen patiently if asked, what are the flora and fauna of Jupiter?" No chemist, it might be replied, would have listened at all twenty years ago, if asked whether there is any iron in the sun, or any hydrogen in Sirius? Not a hundred years since, it would have been deemed visionary, if not impious, to think of measuring the bulk, weight and periods of the heavenly bodies, as it still seems scarcely credible that we are beginning to trace their chemical constitution and climatic features; and if any of them should yet exhibit the organic conditions of psychical phenomena, through some ethereal thrill, of which we cannot now conceive, this would only be what the physicist might expect as the flower of the cosmic life, and what the divine is prepared to accept on other grounds. Professor Tyndall has already said substantially that all our politics, art, and philosophy are but consequences of the refrigeration of a cooling planet whirled off from the sun; and the eloquent Chalmers, though he thought it might be overstepping the modesty of true science to speculate concerning the mineralogy and botany of other globes, could still argue from the analogy of celestial mechanics that our terrestrial ethics must agree with

the celestial ethics, dominating all the higher intelligences with which his creed had peopled the distant places of the universe. Be that as it may, with this new spectroscopic apocalypse of the heavens opening before us, it is too soon to debar the celestial realms which have not yet been explored, as forever conjectural and unknowable. It will be enough to inscribe them as *terra incognita* on the map of science. That map will be incomplete without them, not merely because theoretically the field of research must be held to be co-extensive with the domain of nature; but also because celestial and terrestrial phenomena, instead of being simply collocated, are connected, and so intimately connected that together they already form one vast mechanism governed by universal law, and may yet also appear as one mighty organism pervaded with life and reason.

The practical importance of thus keeping the celestial in connection with the terrestrial division of the sciences, may be seen in the mistakes into which Comte fell by disregarding this distinction throughout his series, except in the first. Admitting it into astronomy as celestial mechanics, he proceeded at once to terrestrial physics, ignoring celestial physics as largely inaccessible, and being ignorant as yet of celestial chemistry; and when he reached his topmost science, having discarded the metaphysical as well as celestial realms of inquiry, he could only make man the god of this little planet, leaving the myriad worlds around us as devoid of theology as of the higher physical science.

As to the succession of phenomena in time, science has shown that they proceed from the simple to the complex. Although the different classes of facts are distinct and separate, yet they are found succeeding one another in a fixed order of mutual dependence and increasing multiformity, each involving its predecessor, and becoming a condition precedent to its successor; and with such actual procession of phenomena must correspond according to our doctrine, the normal procession of the sciences. This important principle, first announced but imperfectly applied by Comte, may be easily tested by tracing it through the series of fundamental

sciences which we have enumerated, as well as by showing what confusion would arise, both in nature and in our minds, if that series were broken, reversed or deranged.

Beginning with the physical or mechanical sciences, we find them plainly preceding and supporting the chemical sciences. The phenomena of moving masses and undulating molecules occur before, and independently of their combination in different kinds of matter, and may be studied quite apart from any inquiry into the elementary constitution of bodies, and even experimentally separated for special investigation. The physicist need know but little of chemistry so long as he deals only with the forces of gravitation, heat, light, electricity which play between masses outside of molecules, or in the all-pervading ether.

In like manner a step higher in the ascending series the chemical sciences are found to rest upon the physical, while they uphold the organical sciences. The phenomena of combining atoms, as shown by different kinds of inorganic matter, though largely conditioned by the physical forces of gravitation and heat, and often attended with light and electricity, are themselves distinct and separate, having their own laws of affinity and likeness, and are, at the same time, quite independent of the next and more complex phenomena of organic or living matter with which they have no absolute and invariable connection. The chemist, therefore, should know much of physics, if he would understand the conditions of weight and temperature under which atoms will unite to form the compounds with which he deals; but he need know little or nothing of biology, unless he chooses to advance into the region of so-called organic chemistry, with the view of studying the composition of living tissues.

And so, in their turn, the organical sciences will be found to have a basis in the chemical, and afford a basis for the psychical sciences. The phenomena of living organisms, such as plants and animals, though largely predetermined by the physical forces of heat and light, and constantly involving the chemical composition and decomposition of the organic elements, oxygen, hydrogen, nitrogen, and carbon, are nevertheless unique and accessional, having their own

laws of life and growth, and can as little be confounded with the psychical or mental phenomena which supervene only in organisms of the highest class. It is true that organisms react upon the physical forces of gravitation, heat, light, and electricity as appears in swift-flying birds, warm-blooded animals, luminous insects, and electric fishes; and it is also true that they resist or repair chemical disintegration as well as evolve new chemical processes and compounds. And these are simply further reasons why the biologist must know something of physics, and much of chemistry in order to master the endless varieties of organic structure and function with which he has to deal; but he may remain in scornful ignorance of the whole realm of mental science, unless he cares to wander into the dim border-land of so-called animal psychology in search of the germs and semblances of human faculties and feelings.

Leaving material nature beneath us and ascending into the psychical sciences, we find them resting upon all the organical, chemical, and physical sciences below them, and at the same time, sustaining the social and religious sciences above them. Although the phenomena of sensation, emotion, and thought, are closely implicated with the senses, the nerves, and the brain, yet they are clearly distinguishable from any molecular movements in the organism as additional facts of consciousness, having their own laws of association and reasoning; while on the other side, by their individuality and seclusion, they stand apart from the more complex phenomena of society. It is true that the mind largely derives from its whole physical environment the impressions which it forms into cognitions and conceptions; and it is also true that it is greatly modified by its whole social environment through other like minds with which it is connected in constant interaction. And hence it is that physiology is the proper door through which to ascend into psychology, where each may rest as sole sovereign in the empire of conscious thought and action, unless he would advance into the higher and broader region of observed thought and action, by the steps of comparative psychology, as shown in the mental manifestations of savages, of children, and of different classes of civilized men.

On that higher plane of inquiry, the social sciences would then present themselves as the next following link between the mental and religious sciences. As all society exists potentially in the individual, and is but composed of individuals, the phenomena of associated human beings, as seen in the constitution and history of different tribes, nations and races, cannot be wholly detached from the individual organisms which have combined to produce them; and yet they occur in a region outside of personal consciousness and volition, as general resultant facts of human nature and human action, governed by their own laws of recurrence, inheritance, and progress, which no combination of individual wills, not even legislation or revolution, can thwart or set aside. The immense diversity and complexity of modern civilization, involving as it does the intellectual and moral products of all climes and ages, have, indeed, seemed to make a science of sociology impracticable, and some have even thought it also irreverent, because of an imagined inconsistency of social laws with the Divine will. It is to be approached through the preliminary sciences of geography, ethnology, archæology, and historiography, and should properly be restricted to the mental and moral laws of social organization and development; since the higher and final class of religious phenomena, if sought in this direction, can only be reached by a further ascent through comparative theology, in the study of the different religions of mankind.

Emerging at length, by this new method of approach, into the religious sciences, we find them at once distinct and pre-eminent. No other and higher class of facts remains, and, therefore, no further class of sciences. The religious phenomena of humanity, though deeply involved in both the individual and social organism, are nevertheless themselves presented in an extra-human or superhuman region, by what the latest scientific thought defines as the Absolute Reality, unknowable and inconceivable, howsoever practically treated, whether as a mere ideal personification or as a real personality.

And thus at the summit of the sciences we have reached a limit which divides the empirical from the metaphysical

region of inquiry. But into that transcendental realm we are not yet ready to venture. Turning to retrace our steps, let us still further test the series in a descending order, by imagining one supporting link after another removed or displaced. Take away the social laws which uphold religious phenomena in history, and nothing of religion would be left but savage superstition or subjective illusion. Take away the mental laws which uphold social phenomena, and there could be no organization and development but that of animal tribes revolving in the same circles from generation to generation. Take away the organical laws which uphold mental phenomena, and the intellect of man alike with the instinct of the brute, would disappear. Take away the chemical laws which uphold organic phenomena, and the whole vegetable world would wither away into a volcanic waste. Take away the physical laws, which uphold chemical phenomena, and nought would remain but an inorganic mass. Ascend or descend the scale of nature, you find its ranks nowhere broken and never inverted. And the concatenated classes of facts require corresponding orders of concatenated sciences. However much either the sciences or the facts may overlap and return into each other, they still form one compact series, like a spiral staircase winding from earth to heaven.

We have seen how facts are connected in space, and how they are connected in time; but it still remains to connect these connections, in order fully to adjust the scheme of the sciences to the actual framework of nature. Now the progress of research has already begun to show that the same procession of phenomena from the simple to the complex which obtains upon the earth, prevails also, in part at least, throughout the heavens, and therefore the sciences, conforming to the phenomena, combine a collateral with their linear arrangement, embracing spacial comprehension in the temporal succession. In other words, mechanical science, in both its celestial and terrestial provinces, precedes and supports chemical science, as chemical science, in both its celestial and terrestrial provinces, rests upon mechanical and precedes organical science.

The spectroscope is showing us a sort of physical history

of worlds in the successive forms of the nebula, the star and the planet, almost as plainly as we can trace the physical history of our own globe through the like stages of cosmic growth; and we are thus gaining empirical proof, not only that the evolution of celestial phenomena corresponds to that of terrestrial phenomena, but consequently that the normal procession of the sciences is the same in their celestial as in their terrestrial realms of research.

Mr. Herbert Spencer, by his magnificent doctrine of universal evolution through space and time, has unwittingly afforded a foundation for this vast serial arrangement; and Mr. Fiske has aided it, while repudiating it, by suggesting sciences of development or genesis, such as astrogeny, biogeny, sociogeny, which exactly comply with its conditions. It would be easy, in accordance with such views, to trace the successive sciences through the successive stages of that mighty development which is supposed to have proceeded from an indefinite antiquity throughout immensity; the physical sciences, as displayed in the ancient sidereal nebulæ, revolving and condensing into galaxies, suns, and planets, radiating heat and light; the chemical sciences, as displayed in the molten core and hardened crust of our earth, with its slowly forming strata of rocks and solids; the organical sciences, as displayed in the floras and faunas which have flourished and decayed, with increasing complexity and refinement of structure, until at length man appeared as the paragon of animals; the psychical sciences, as displayed through the varying scale of sense, instinct, understanding and reason, infant and adult, rude and cultured; the social sciences, as displayed in the organizing and evolving races and peoples, with their advancing arts, polities, and civilizations; and at last the religious sciences, as displayed in growing traditions, creeds, and cults, Pagan and Christian, ever struggling for ascendency and prevalence. And it would thus be found that the evolutionary series of facts throughout space and time, at least as far as it has yet been traced, everywhere and always supports the corresponding series of sciences, ranging like mountain peaks, which rise one above another, from the solid ground, until they are lost from view in the clouds.

It is too soon perhaps to predict any practical value in a celestial biogeny, or psychogeny, or sociogeny, as projected in the scheme of science; and yet, in view of past discoveries, it is quite conceivable that scientific light may yet be shed upon such problems as the genesis of other worlds, their moral condition and relative progress, their adaptations to the angelic hierarchy, their interest in our earth, their common relationship to a Universal Father in heaven, and other like questions often relegated to a mystical theology, or adjourned to heaven itself as vaguely imagined to be somewhere outside the astronomical universe.

In further proof and illustration of this order of the sciences, let it be observed, in the first place, that it is also the order of their historic evolution. It is true, such a coincidence would not be indispensable. The historic procedure is not always and necessarily normal or philosophical. There have been great ebbs and floods of the sciences, as Bacon expressed it, with the rise and fall of empires. Man, too, is not the measure of nature, and to an intellect sufficiently enlarged or able even in fancy to free itself from terrestrial limitations and vicissitudes, the true universal order of knowledge might still appear accordant with the universal order of facts however much it had become confused in the human consciousness, or deranged by the processes of human research. As a matter of fact, however, no such general confusion or lasting derangement has taken place. The history of the sciences shows that they have actually proceeded, and are still proceeding, serially from simple to complex facts, throughout space and time. All the physical sciences have long been and still are greatly in advance of all the psychical sciences, and each in particular in advance of its predecessor,—chemistry ahead of biology, and psychology ahead of sociology. The defects which Mr. Spencer has exposed in the Comtean series do not partain to the serial principle itself, as more strictly and fully applied, and the mutual helpfulness and interaction of the sciences upon which Mr. Fiske has enlarged, have nothing to do with the question of their relative advancement in scientific exactitude and completeness. Astronomy, as a physical science, is centuries older than chemistry, as

chemistry is at least half a century older than biology; and though the two younger sciences have given to astronomy the spectroscope and the Spencerian theory of evolution, yet they have not thereby overtaken their elder sister in the race for exact knowledge. It is still true, in the main, that our science of the heavenly bodies is more perfect than that of our own bodies and of surrounding phenomena, since we can predict eclipses centuries hence to the minute, while we cannot foretell the state of the weather or of our health a single week, simply because of the cumulative complexity and contingency of the latter class of facts. And judging the future by the past, we shall doubtless continue thus to master phenomena in the order of their relative generality and independence of one another. Tried, therefore, by any of the tests of scientific perfection—mathematical exactitude, theoretical consistency, power of prevision—it will be found in all history that the simpler sciences have ever led and still lead the more complex sciences as in serried ranks without a break or a recoil.

In the second place, this order of the sciences is also the order of our logical convenience. It is the true psychological as well as cosmological and chronological order. Even if it were not, we have maintained it would still be tenable as the only philosophical arrangement of knowledge. It is not to be presumed, in advance of any experience, that nature must present her phenomena to us in a strictly logical succession, adapted to our narrow faculties and modes of investigation, so that what is first and last in our course of reasoning must also be what is first and last in her course of development. Nor would any preconceived scheme of research which we might frame necessarily prove the most suitable and serviceable when applied in the actual process of scientific inquiry. On the contrary, history has developed a scheme quite different from that which men might have anticipated as most probable, and which at times they have blindly pursued as most promising. Naturally engrossed with the adjacent and impressive phenomena of their own bodies and minds, they essayed for centuries to construct the mental before the physical sciences, psychology and physiology in advance of

chemistry and astronomy. But now that by hard and long experience we have been forced to follow the order of facts in our researches we can see, in the light of our own failures and successes, that such an order is supremely rational as well as natural, and that in adopting it we are but acting on the logical principle that we must master the simple before advancing to the complex phenomena, and study both in their essential dependence and connection. In other words, we have found that logically we must proceed from physics to chemistry, and from chemistry to biology; and we are beginning to see that we must ascend through physiology into psychology and sociology, and that even theology as an empirical science must be studied in its historical development in human society before it can acquire all the data needed for its completion. Thus does nature, in spite of the perversity of man, like a severe yet kindly teacher, oblige him to begin at the lowest round in the ladder of the sciences, and toil patiently upward, from one degree of attainment to another, with increasing skill and ardor, towards the fulness of perfect knowledge.

In the third and last place, this order of the sciences is also the order of their practical importance. Mere utility, indeed, as we have already seen, is not a philosophical principle of classification, unless it be in the so-called practical sciences or scientific arts. It is conceivable that pure theoretical knowledge, following the general succession of facts in the universe, might proceed independently of man, or might prove wholly insusceptible of adjustment to his concerns. As it is, however, the most abstract science, though pursued only from a disinterested love of knowledge, will often in its practical applications surprise the world with its vast benefits, and compel the vulgar to turn and heap their applause upon the man whom they may have pitied as a stiff pedant, losing himself in wordy nonsense, or a mild enthusiast seeking new relations for very old facts. Condorcet has strikingly observed, that the sailor, whom an exact calculation of longitude preserves from shipwreck, owes his life to a theory conceived two thousand years ago by men of genius who were thinking of nothing but lines and angles; and in our own day we have

seen a toy-like battery in the college lecture-room of Professor Joseph Henry become that miracle of modern civilization, the Atlantic telegraph, in the hands of the more utilitarian inventor. And upon this principle as thus guarded, we shall find that the scale of the sciences with their issuing arts most wonderfully agrees with the scale of human interests; the least important being at the base, and the most momentous at the summit, while those of subordinate significance fill the intermediate ranks. To state it differently, man as the microcosm appears to have in his constitution a gradation of relations and capacities, corresponding to the gradation of phenomena which he seeks to know by his science and to modify by his art. The physical, chemical, and organical sciences lead up through the mineral, vegetal, and animal kingdoms of which he is the organic head and lord; while the physical, social, and religious sciences ascend through still higher realms of human interest toward the highest of which he can conceive; and in the train of these linked sciences follow such useful arts as commerce, manufactures, agriculture; such æsthetical arts as music, painting, architecture; and such moral arts as medicine, jurisprudence, and divinity. So does science, in conducting her votaries through the difficult school of nature, reward their fidelity with ever-gathering laurels and trophies for the advantage and exaltation of our common humanity.

If we now seek for a compact result of this discussion in some convenient working classification, which shall be adapted to the existing state of our scientific knowledge, without expressing its more theoretical domains and boundaries, we may obtain it by arranging, as in the following table, a parallel series of principal or capital sciences, embracing only such provinces of facts as are now actually under scientific investigation and bearing familiar names, etymologically descriptive of their areas and limits:—

Fundamental Sciences.		Principal Sciences.	
Celestial and Terrestrial.	Physical.	*Physical.*	Astronomy.
	Chemical.		Geology.
	Organical.		Anthropology.
	Psychical.	*Psychical.*	Psychology.
	Social.		Sociology.
	Religious.		Theology.

In this scheme each Principal Science represents in a concrete form the parallel group of Fundamental Sciences to which it corresponds, and includes, as its special domain, all of those Fundamental Sciences from which it is not excluded by its immediate predecessor and successor in the series. Astronomy, the science of the stars, being the most comprehensive science in space and time, embraces the whole region of celestial physics, chemistry and organics, and the unknown realms of celestial ethics and politics, together with the unsolved problems of the origin and destiny of galaxies, suns and planets. Geology, the science of the earth, as distinguished from the other planets, embraces the region of terrestrial physics, chemistry, and organics, with the unsolved problems of the origin and destiny of the globe, and of the strata, floras and faunas upon its surface. Anthropology, the science of mankind as distinguished from the other animal races, includes physiology, ethnology, philology, archæology, together with the unsolved problems of the origin and destiny of human races, languages and arts. Psychology, the science of the mind as distinguished from the body, embraces æsthetics, logic, and ethics, with inquiries into the origin and destiny of the soul and the development of its sensations, cognitions, and emotions. Sociology, the science of society as distinguished from the individual, includes technics, economics, and politics, with inquiries into the origin and destiny of the family and the state, and the development of civilization. Theology, the science of religion, as distinguished from politics, includes comparative and theoretic theology, with inquiries into the origin and destiny of traditions, creeds and cults, and the development of essential religion. And thus the sciences tower upward to a summit, from whence, as from a mountain peak, we may survey the vast region of human research, with its remote frontiers fading into the far horizon of infinite space and time, and its nearer provinces, spread out beneath us, like cantons bounded by thread-like hills and rivers, and dotted with shining cities and villages, that serve to mark how far the works of man have encroached upon the wilds of nature.

We have at length reached a point in the investigation where some larger and more precise definitions of science are needed. Hitherto we have simply maintained that facts are the material of scientific knowledge, without inquiring into the cognitive process itself; but facts, in the course of that process, as it is well known, have become decomposed into their subjective and objective elements under the names of phenomena and noumena, the former referring to things as they appear or are manifested to our senses, and the latter to things as they exist by themselves and only in our thought. And it is now a moot question whether noumena as well as phenomena should be included within the field of scientific inquiry, or, in other words, whether only the patent laws of facts, their mere coexistences and successions, or also their occult substances and causes, are scientifically knowable. To this question may be applied our next principle.

IV. *A philosophical scheme of the sciences should embrace both their empirical and their metaphysical divisions in logical correlation.*

The important distinction between empirical and metaphysical inquiry which obtains in every class of facts, and therefore in every science, is as old as Aristotle, was emphasized by both Bacon and Newton, and at length thoroughly excogitated by Berkeley, Hume, and Kant. But it has been reserved for Comte to formulate it into a supposed law of scientific development under which it is claimed, that the empirical region of phenomena and laws have been finally separated from the metaphysical region of entities and causes as by an impassable gulf, and the former retained as the only legitimate field of positive science, while the latter is to be forever abandoned as a mere realm of superstition and speculation. Whatever may be said of the truth or error of this law, viewed simply as a law of the evolution of empirical science, it cannot be denied that by proclaiming it, Comte has done a lasting service to both parties in the controversy, and opened the way, however unwittingly, to a just and final definition of their several provinces and frontiers in the domain of philosophy. Never before has the breach between them been made so conspicuous; never before have they been so freed from

mutual restraint and interference, the empiricist from the wings of speculation, and the metaphysician from the clogs of experience; never before have they proceeded apart, each his own way, to so wild extremes, as for example in the systems of Comte and Hegel; and consequently never before has the philosophic mind been so favorably poised for healthy reactions towards the true, safe, intermediate position. In calling attention to some of these reactions from the empirical side, the present aim is not at all to enter a plea for the study of metaphysics, still less to discuss its methods, but simply to claim for it its due place on the chart of the sciences. If it would be unphilosophical, as we have seen, to exclude any known class of facts from the field of legitimate research, still more unphilosophical would it be to debar any portion of their reality from investigation, merely because it rests under an opprobrious name, or has hitherto seemed to baffle inquiry. No scheme of the sciences could be complete which would shut out one entire hemisphere of existence from view as effectually as if it were the farther side of the moon. Its very occlusion and mystery have been a constant challenge to the greatest intellects of our race, and the recent discoveries in physical science, especially in celestial physics, if not themselves largely metaphysical triumphs, should at least warn us that the most transcendental realms of nature, through unlooked for avenues, may yet be thrown open to our curiosity, and have their nebulous vagueness resolved into lucid stars and worlds of life.

At the outset of this inquiry, it should be remembered that Comte himself merely ignored the metaphysical region, arbitrarily and indeed somewhat contemptuously, but without erecting any cognitive theory as a barrier against it. In this reserve he was, perhaps, wiser than some of his disciples and critics. It was enough for him to restrict empirical or positive science to the study of observed phenomena, and turn his back upon all inquiry into their essential nature and origin as mere infantile curiosity or vain speculation. And he claimed to do this, as we have said, not in virtue of any metaphysical doctrine of knowledge and being, which he had framed, but in consequence of an empirical law which he had

discovered, and which he applied to the positive sciences alone, without so much as examining the claims of metaphysics to any different method and procedure. It is plain, therefore, that metaphysic has suffered no curtailment or invasion from Comte other than the popular fling at it, which its name may convey. Indeed, it was his habit to stigmatize as metaphysical, not merely all essences and causes, but even such phenomena as seemed to him inaccessible because of their remoteness and complexity; and he rashly forbade certain problems in sidereal dynamics, geology, and biology, which have since been solved, or are in a fair way to solution. In a word, his whole system is purely negative in its bearing upon true metaphysics. Even though it were fully adopted, it would still be not incompatible, as Stuart Mill has shown, with sound metaphysical conceptions of time, space, force, life, and mind; while, if freed from its grotesque theory of religion, it might even be held consistently, as it has been actually, with some of the most transcendental forms of theology. "The English positivism," says M. Janet, distinguishing it from the French, "has a psychology and a metaphysic, and consequently treats of problems which are not in the domain of the positive sciences." German and Italian positivism, also, according to Professor Barzellotti, are "at bottom metaphysical."

But whilst Comte was thus content simply to ignore the metaphysical realm as unknown, Mr. Herbert Spencer has essayed to prove it also unknowable, partly from the relative nature of our cognitive faculties, and also from the contradictory character of our ontological conceptions. A passing remark upon each of these points seems requisite.

As to the doctrine of relative knowledge, the cardinal tenet of the school, it may be doubted if there has ever been a controversy involved in such mere word-puzzles and logomachies. When Professor Fiske, tersely putting the case with so much apparent clearness, affirms that "no patience of observation or cunning of experiment can ever enable us to know the merest pebble as it exists, out of relation to our consciousness," everything depends upon the definition of consciousness. If it simply means intellect or knowledge,

the statement amounts to the mere truism, that we can only know the pebble through our knowing powers; but if consciousness include subject and object as usually defined, and the meaning is, that we can only know the phenomenal and not also the non-phenomenal part of the pebble, then the statement is very far from being true. We can know both, and the latter even more scientifically than the former. We can know, in general, the independent reality of the pebble, the fact of its existence out of relation to our consciousness, and we can know in particular, and with scientific accuracy, some of its non-phenomenal realities, the infinitesimal atoms, the immaterial crystalline forces, the insensible ethereal properties which lie folded within and behind its phenomena, and which can never by their very definition, be phenomenally manifested to us, or even distinctly imagined. In a word, we can know both the otherness and the inwardness of the pebble, the thing as it exists by itself and in itself, and among its essential relations to other noumena, as well as its accidental relations to our consciousness.

Mr. Spencer himself admits what he terms a "transfigured realism," that there is at least some objective existence, though its modes and their connections may not be objectively what they seem. And Professor Tyndall has most abundantly and clearly shown in his eloquent lecture on "The Scientific Imagination," that beyond the range of phenomena, and beyond the reach of our senses or of any possible microscope, there is a world of extra-sensible realities, in other words of metaphysical entities, where science still reigns in all the rigor of mathematical exactitude.

As to the other point, the ontological paradoxes, largely derived by this school from the writings of Hamilton and Mansel, it is enough to say at present that such arguments can only return to plague the inventors. If it be maintained that all our ultimate ideas of time and space, cause and force, the infinite and the absolute, when excogitated, will develop endless contradictions from which we cannot escape,—this would simply be proving too much for the purpose. The empiricist who accepts these results must be content to openly build his whole system of positive science upon confessed

absurdity as well as nescience, while the metaphysician who rejects them may still retain all that is true in positive science, and at the same time seek for it a more rational basis. And that the reasoning is impracticable, as well as somehow fallacious, has been conspicuously shown by its own authors, who, not deterred by the logical torpedoes which they had planted in the shoals of the metaphysical ocean, have themselves sailed out sheer beyond them on voyages of the most adventurous speculation. Mr. Spencer, whilst professedly renouncing and abolishing all metaphysics, has, nevertheless, on the basis of his own doctrine of knowledge and existence, proceeded to erect one of the most imposing metaphysical systems of the world, which has appeared in modern times. Beginning with the transcendental mysteries of primordial matter and force, as displayed throughout infinite space and time, he has exhibited to us a universe in evolution, from the most ancient nebula in the depths of immensity up to the most recent commonwealth upon the surface of our planet. The whole proceeds under fixed progressive laws which carry with them, in spite of all disclaimers, as the late Mr. Chauncey Wright has clearly shown, a cosmological and even teleological import, at least as much of order, fitness and result as may be seen in a poem or a drama, however devoid of mere human interest and utility. And this evolving and dissolving universe is described as the phenomenal manifestation of an Absolute Reality or Persistent Force, of which we can know nothing except as it may be known in and through the intelligible cosmos which it upholds and which is inseparable from it even in our thought. Professor Fiske, besides expounding the Spencerian cosmogony with great acuteness and force, has based it more firmly upon a purified theism, and done special service on the metaphysical side of theology by exposing very fully a gross form of error known among orthodox divines from the time of Tertullian as anthropomorphism, or the tendency to clothe Deity with human imperfections and passions. Nor can it be said that the value of these metaphysical contributions is destroyed by the contradictory elements which they somewhat accidentally involve, since there are those who know how to disengage

them in a pure state, and render them compact and congruous with a very different theory of knowledge and being.

Besides such unwitting testimonies, there have also been open avowals in the same quarter. "England's thinkers," said Stuart Mill, "are again beginning to see, what they had only temporarily forgotten, that the difficulties of metaphysics lie at the root of all science; that those difficulties can only be quieted by being resolved, and that until they are resolved, positively whenever possible, but at any rate negatively, we can never assume that any knowledge, even physical, stands on solid foundations." And soon, as if to fulfil these words, appeared Mr. Lewes, breaking the ranks of the positivists with a flag of truce in his hand, and proposing to annex the whole extra-sensible province of metaphysics and leave the remaining super-sensible region to so-called metempirics and divines. At the same time the scientific literature of the day has become leavened with a sort of speculative physics which, so far as it goes, is simply metaphysics without the name, and as recondite as any that has reigned in the schools. "Even some great captains of science," exclaims Mr. Lewes, with the enthusiasm of a convert, "while standing on triumphal cars in the presence of applauding crowds, are ever and anon seen to cast lingering glances at those dark avenues of forbidden research, and are stung with secret misgivings lest, after all, those avenues should not be issueless, but might some day open on a grander plane." In the midst of his physical discussions, Grove was constantly coming on what he termed "the alluring paths of metaphysical speculation." Faraday for a long time doubted whether the conservation of energy should not be treated as a metaphysical question, though at length he decided to view it only on its physical side. The Scottish Professor Tait was doubtless only speaking for the great mass of scientific men when he declared, in a recent lecture on physics, "There is a science of metaphysics, but from the very nature of the case the professed metaphysicians will never attain to it." As if to confirm this opinion, the leader of English science, Professor Huxley, has profoundly remarked that the "reconciliation of physics and metaphysics lies in the acknowledgment by physicists

that all the phenomena of nature become known to us as facts of consciousness; and by metaphysicians, that the facts of consciousness are practically interpretable only by the methods of physics."

Nor is this great reaction confined to one country. Doctor Stuckenberg, in his recent "Introduction to Philosophy," cites the chief scientists of Germany as uniting in the same view of the present speculative crisis. Du Bois Reymond is quoted as lamenting the lack of philosophical culture among physicists. Haeckel admits that their errors are largely due to a crude empiricism which they laud as exact science. Fechner says that when the scientist comes to atoms he needs metaphysics, and that the ultimate problems of the physicist and metaphysician are the same and can only be solved on condition of their coöperation. It is a practical confirmation of these opinions that the Academy of Sciences at Berlin admitted to membership the two distinguished philosophers, Zeller and Harms, with the distinct avowal in the address of welcome, that the signs of the times show that the reconciliation of natural science and philosophy is gradually approaching.

Inasmuch then as both the new school of scientific metaphysicians and the old school of professed metaphysicians are together entering and reëntering the trodden field, though from opposite sides, and already coming in sight of each other, it may not be too soon to look for their friendly meeting on common ground, or at least to arrange the terms of correspondence and peace. Every day, it is becoming evident, in the progress of research and thought, not only that each science has its metaphysical as well as empirical portion, but also that the two, throughout the series of sciences, are in close correlation; so that the most advanced discoveries at length abut upon some metaphysical problem, while the most advanced speculations still depend upon some empirical investigation.

In physical science, we have been led beyond masses and molecules into a universal æther, quivering between matter and spirit, at once phenomenal and non-phenomenal, impressing our senses in sound, heat and light, and yet itself as occult

as any quiddity of the schoolmen. In chemical science we have penetrated through solids, liquids and gases, among infinitesimal atoms, so definite that they can be mathematically weighed and measured, and yet so indefinite that no microscope will ever detect them; now grouped as solid spheres, cubes or rings, and anon clustered as mere spaceless centres of force. In organical science, we have advanced through varying animal and vegetal forms to an ultimate protoplasm, composed of lifeless atoms, yet endowed with living forces; an almost infinitesimal cell, and yet a very microcosm of molecular wonders; wholly structureless in itself, and yet the source of all the manifold structures of the organic kingdom. In psychical science, we have ascended through the tissues, the nerves, and the senses, to an individual mind, unseen yet ever seeing, enslaved in matter, yet keeping an ideal empire over material nature, localized in the brain, yet embracing the remotest sidereal heavens in its scope. In social science, we have emerged among associated minds, organized in perishing bodies, yet transfiguring all surrounding nature into a new world of art; fast bound in different lands, tribes, and tongues, yet knitting continents together with telegraphic nerves and enveloping the world with simultaneous thought; ever dying, yet transmitting to future ages the ideas of long-extinct civilizations. And at length in religious science, we have risen above all finite mind, individual or social, in full view of the one Infinite Mind, invisible and incomprehensible, yet manifested in nature and revealed to humanity through all intelligible forms.

At the same time, on the empirical side of this ascending scale of the sciences, we now find a projected series of correlated forces, physical, chemical, organical, surmounted with a series of cöordinated wills, individual, social, divine; while on the metaphysical side of the same scale of the sciences we find a corresponding series of efficient and final causes, rising from some great first cause toward some ultimate supreme end, by the subordination of the mineral to the plant, the plant to the animal, the animal to man, the individual to society, and society to Providence. And

now it remains to bring these two complemental series into their due logical dependence as supporting segments of one and the same arch; to connect forces with their causes, laws with their purposes, means with their ends, throughout nature, as fast, but only as fast as science discloses them; to show that, sooner or later, we reach a point where, in the view of both the empiricist and the metaphysician, all forces appear as but potential in one Fundamental Energy, and all laws as but methods of one Universal Mind; and thus to trace, though as yet in part and step by step, the career of the Absolute Will proceeding rationally towards the Infinite Reason, through the physical and psychical phenomena in which it is exerted and expressed throughout immensity and eternity.

That the two opposite sections of the sciences do thus tend to unite as complemental hemispheres of truth, has long been a rational presentiment, if not an accepted result among the comprehensive intellects that are capable of including them both in their thought. Bacon, though he remanded final causes to metaphysics, and efficient causes to physics, still maintained that the two agree excellently together as expressing the intentions of Providence in the consequences of nature. Newton, while he bade physics beware of metaphysics, would have us proceed from motions to the forces producing them, and in general from effects to their causes, and from particular causes to more general ones, till we come to the First Cause, which is certainly not mechanical. Herschel thought it but reasonable to regard the force of gravitation as the direct or indirect result of a consciousness or a will existing somewhere. The distinguished naturalist, Wallace, has deemed it no improbable conclusion, that all force may be will-force, the only primary cause of which we have any knowledge, and thus the whole universe dependent on the will of one Supreme Intelligence. Professor Cooke, of Harvard, claims it to be a legitimate deduction of science, based upon the only analogy that nature affords, that the energy which sustains the universe is the will of God, and the law of conservation only the manifestation of His immutable being. As the movements of the body, says Professor Young,

the astronomer, are the actions of the personality which inhabits it, so must we regard all the wonderful interactions of atoms, and masses of matter as in some way the action of the all-pervading intelligence and power. There is also a teleology, says Professor Lange, the historian of materialism, which is not incompatible with Darwinism, but almost identical with it, and there are ideal developments and speculative extensions of this correct teleology, which lie in a transcendental sphere, but for this very reason can never come into conflict with the natural sciences.

Such testimonies—and a host of others which might have been cited—are not the foregone conclusions of professed metaphysicians and theologians, speaking in the supposed interest of orthodoxy, but the careful deductions of practiced investigators, seeking in a strictly philosophical spirit to give unity to their scientific knowledge, and find rational postulates on which to base a consistent theory of the universe. And even the extreme empiricists and metaphysicians, as they build their systems apart from each other, can only appear in the view of larger, architectonic minds, like workmen unwittingly constructing counterpart fragments of the same structure. The world may yet see the "persistent force" of Spencer identified with the "absolute will" of Schopenhauer, the aimless cosmos of Comte supported by the "absolute reason" of Hegel, and the conflicting "will and reason" of Hartmann harmonized in the Christian conception of a wise and benevolent Creator.

For such reasons the correlation of the empirical and metaphysical provinces in the scheme of the sciences will be of great practical importance. It is only by holding them together that the schism in modern philosophy can be healed and its dissevered members become knit into one logical organism. If left growing apart, the positivist will be in haste to detach all empirical science from metaphysics, especially from theology, as a mere mass of crude knowledge without rational support and consistency; while the absolutist will ever be prone to erect metaphysics into an independent science of abstract existence, or to confound it with philosophy as a preliminary science of first principles or to blend it with

logic as a mere speculative dialectic. Whereas they are both but co-workers in the same field of research, dealing with the same phenomena only by different methods.

Descending, however, from these remote questions, we now have before us a series of sciences, half empirical, half metaphysical, arranged as classified objects of philosophical study. With their adjoining provinces they may be thus presented to the eye:—

THE TWO SCIENTIFIC PROVINCES.

Empirical Region of phenomena and laws.		*Metaphysical Region of essences and causes.*
	Religious.	
	Social.	
	Psychical.	
	Organical.	
	Chemical.	
	Mechanical.	

There is but one more problem which this series presents for investigation. It is perhaps the most difficult problem that can task the philosophic mind, and yet a problem that is likely to grow in interest and importance with the general growth of knowledge. At this point we only state its terms in the form of a concluding proposition.

V. *A philosophical scheme of the sciences should have its completion in a general science of all the other sciences, based upon their historical and logical evolution.*

If such a last supreme science be at all feasible, its high claims cannot be questioned. Without it the sciences, even if complete in themselves, might still appear as mere fragmentary masses of knowledge, having no rational coherence and no orderly progression. And to forego the search for it merely because of its intricacy or difficulty would be as unphilosophical as to abandon any other class of involved phenomena; for the sciences are themselves phenomena, mental and social phenomena, and are presumably regulated by laws which may yet be ascertained. Certainly no scheme of human knowledge could be complete which did not at least provide for this remaining field of inquiry, nor would the scientific propensity itself be exhausted and satisfied until it had entered that field and held it as its crowning conquest.

The conception of such a science as here stated, it will be seen, is wholly objective and *a posteriori*. It is not a science

to be evolved *a priori* from any single mind by a mere study of the cognitive faculties and processes; nor yet a science to be constructed out of the other sciences in a purely artificial manner, as a mere feat of systematic logic, by simply grouping and combining their extant products, like specimens in a cabinet or topics in a treatise. It is a science which must have its roots in the whole past intelligence of mankind and grow from generation to generation as a vast rational process, not only external to the individual mind, but often in spite of individual caprice and interference. And it is a science which must bear the high qualities and submit to the rigorous tests that distinguish all science from mere crude knowledge. If it be a science at all, it must have its theories explaining the cognitive phenomena of the sciences as clearly as physical theories explain material phenomena; it must set forth its laws of scientific development as plainly as the laws of any physical evolution; and at length it must enable us to review, survey and project the entire procedure of the sciences, one after another, from age to age, as intelligently as we may trace a root, leaf, and flower.

Now it is obvious that this mere conception or anticipation of such a science, as well as the science itself, could only come late in human history. A few master minds, in former epochs, like Roger Bacon and Campanella, may have had yearnings for it, as they lamented the crudeness of the existing sciences and strove ahead of their time to purify and organize them. And in our own age some forward intellects, like Fichte and Comte, may have had glimpses of it in a so-called "Doctrine of Science" or "Philosophy of the Sciences," involving parts of the great problem. But at length the need of it, with the growing anarchy of the sciences, has become imperious, and even the hope of it is made attractive by their wonderful march toward completion. As we have seen, the scientific propensity has been steadily advancing through the physical into the psychical realms of inquiry, bringing one set of phenomena after another under scientific laws and theories; first the mental, then the social, at last the religious; and now it only remains to subject the completed sciences themselves as historic phenomena to the

same scientific treatment, and thus put the cap-stone upon the edifice of philosophy.

Accordingly, in our scheme as complete, Philosophy as a science of the sciences appears embracing both the empirical and metaphysical provinces of their whole series, as follows:—

PHILOSOPHY
as
SCIENTIA SCIENTIARUM.

Empirical science of phenomena and laws.	Theology. Sociology. Psychology. Anthropology. Geology. Astronomy.	*Metaphysical science of essences and causes.*

In the original essay upon which this work was founded nearly thirty years ago, the author projected such a *scientia scientiarum* as the first of the three parts of philosophy, the other two parts being termed *ars scientiarum* and *scientia artium*. Since that time he had supposed himself quite alone in these difficult studies, so little attractive to most minds and so far removed from the plain of common interests; but he is now glad to welcome at last one co-worker reaching by a somewhat different route the same high ground of panoramic thought, there to share in the same vast prospect. Professor Flint, in recent numbers of the *Princeton Review*, has been sketching some outlines, or rather preliminaries, of a Science of the Sciences, which are largely in accord with the scheme unfolded in these volumes. According to this learned and acute thinker, the philosophic mind in attempting such a science has four functions or processes to perform; first, as positive philosophy, studying the sciences themselves, somewhat after the manner of Comte; second, as critical philosophy, searching beneath them for the grounds of knowledge, according to the method of Kant; third, as metaphysical philosophy, seeking a theory of being and becoming; fourth, as practical philosophy, inquiring into the ends of existence and the worth of life. So far as this prospectus goes, it might be readily adopted with one or two exceptions, more verbal perhaps than substantial. The fourth division does

not seem quite distinct from the third, since it treats of a strictly metaphysical problem with simply a practical bearing. In the second and third divisions there is no hint of a theory of revelation as falling within the scope of philosophy, not less than a theory of knowing and being. Moreover, all four divisions taken together would not even exhaust the first part of philosophy, besides leaving untouched its logical construction of the sciences and its scientific investigation of the arts. It should also be observed that the proposed general or universal science is presented as primary and initial rather than ultimate and terminal. While such precedence may be true logically of the mere philosophic process of constructing it, yet that universal science itself could never start forth *a priori*, like Minerva from the brain of Jove as a full-armed patroness of the sciences and arts; but it must grow historically out of the sciences and with them, ever completing them indeed, yet becoming itself complete only in and through their completion. This, however, may be made clearer as we now proceed to discuss the conditions of such a science more in detail.

SECTION V.

Conditions of a Science of the Sciences.

If the foregoing conception of this science be just, it is easy to see how far it is feasible, what resources we have for pursuing it, and whether the time has come to inaugurate it. We can at least learn some of its prerequisites.

As the *first condition* of such a science, it is plain that all the other sciences must at least have come into being, and reached some degree of development. To attempt even to project a science without such data, would be like attempting a science of those remote stars, whose orbits and periods can only be ascertained by successive generations of astronomers, or like attempting any science by mere *a priori* speculation, in advance of a full knowledge of the facts upon which alone it could be based. Moreover, science being a function of society, rather than of the individual, society itself, with the

individuals composing it, must have reached a mature stage of intellectual development before it could clearly seize and solve the problem of organizing the sciences and arts which it had produced. It was in plain disregard of this preliminary condition, that the elder Fichte, in his otherwise masterly work, essayed by mere reflection and reasoning, and in defiance of all experience, to construct a general science of knowledge, which should "furnish the ground, not only of all as yet discovered and known, but also of all discoverable and knowable sciences," and which should "absolutely and unconditionally determine what man can know, not only on the present stage, but on all possible and conceivable stages of his existence." And it was one of the chief merits of Comte that instead of following his predecessors in their transcendental search for a metaphysical theory of cognition, he approached the problem of a philosophy of the sciences through the study of the history of the sciences, as they have been displayed in all past society, as well as in the individual consciousness. Both attempts have indeed issued in acknowledged failure, but the latter was at least in the right direction, and may serve to point out the way to future success.

As we have seen in the last section, we are now in a position to avoid each of these errors. We may conjoin with metaphysics that empirical science of which Fichte was ignorant, and with physics that metaphysical knowledge which Comte ignored, and then crown the series of sciences with that synthetic theology, of which neither could scarcely conceive. There would then remain no other special science to be projected, and no other province in any science. And we would thus meet the first and most obvious condition of a universal science of the sciences.

As the *second condition* of such a science we should include among its data not only all the other sciences, but all the existing contents of those sciences, metaphysical as well as empirical, without prejudice and without partiality. History now exhibits to us, in both sections of the sciences, the accumulated results of several thousand years of human thought and inquiry. On the empirical side, we have an

immense mass of facts, theories, and hypotheses handed down to us by seers, sages and scientists of illustrious name and memory; and on the metaphysical side we find a vast body of truths, doctrines and dogmas, attested by prophets, divines and thinkers of equal eminence and authority; while of neither side can it be said that it has been abandoned by the great majority of leading minds at the present day. And until all these intellectual materials have been thoroughly sifted and tested, and their scientific value ascertained, it would plainly be unphilosophical to prejudge and exclude either class of them, or any portion of them. They are the mental and social phenomena which must be accounted for and explained in any consistent and comprehensive science of human knowledge. To offer a theory of the sciences which would ignore either the empirical or the metaphysical doctrines which they now contain would simply be a hasty generalization or induction, drawn from only part of the facts, and destined, it may be, to share the fate of all crude hypotheses. It was the capital mistake of Comte that, while aiming to trace the entire intellectual evolution of humanity, he confined his historical survey to a few nations and to the empirical region of the sciences, cutting off their whole transcendental region with mere epithets as "theological" and "metaphysical." But the healthy separation of empirical research from metaphysical knowledge does not necessarily lead to the destruction of the latter; nor does the substitution of some new scientific hypothesis for some old theological dogma invariably involve a lasting logical antagonism between them. There are those (and they already form a large number) who can consistently hold the extreme theory of universal evolution together with the doctrine of absolute creation and find no insuperable difficulty in combining the two ideas in the conception of a personal Creator, immanent yet independent in his own evolving creation. So that even if positive science had succeeded in excluding theology and metaphysics from the whole empirical region, this would not prove that it had exterminated them or even freed itself from all philosophical connection within them. On the contrary, it would be much easier to prove from the transcendental tendencies of

modern physical research, that the law of scientific development proposed by Comte states but half the truth; that the separation of empirical from metaphysical inquiry is not final and hostile, but convenient and salutary; that a true philosophy looks forward to their reunion; and that sooner or later all empirical science runs out into metaphysics, while all metaphysics must at last run up into theology, as the highest and most comprehensive of the sciences, empirical or metaphysical. In other words, the law of the three states as maintained in this book is complemental rather than antagonistic to that maintained by Comte. While it may be true that science in becoming exact is first theological, then metaphysical, and at length positive; yet in becoming complete it thenceforward reverses the process and is first positive, then metaphysical, and at last theological

It may be said, however, that a defect in Comte's argument has been supplied by other positivists or agnostics who have undermined and exploded the whole metaphysical section of the sciences by means of the doctrine of relative knowledge, and in particular that what has been termed the "deanthropomorphizing tendency" of modern science has proved fatal to the claims of the traditional theology. Having already noticed the former part of this objection, we need only add a remark as to the latter. Mr. Fiske, in freeing the theistic theory of the universe from the grosser anthropomorphism which lingers in the popular mind, has at times so nearly approximated the views of philosophic divines that it is not always easy to discern any essential points of difference; but when he argues that intelligence, volition and personality cannot be attributed to the Deity whose existence he maintains, he is plainly beyond the tether of his own premises. Until some one has succeeded in so far deanthropomorphizing himself as to take a position external to both the human subject and the divine object of cognition, and from thence to demonstrate that there is no analogy whatever between them, the mass of philosophers, with the rest of mankind, will continue to conceive of an infinite and absolute person as the true and only intelligible cause of the world. And this knowledge of Deity, though finite in its extent, may have

even a firmer basis than the knowledge of other noumena which do not manifest any such correlate likeness to our minds, as that of the Absolute Reality expressed to us and recognized by us in the whole phenomenal universe. The mere logical difficulty of conceiving or imagining such an Infinite Personality or Absolute Intelligence is a difficulty which cannot even be appreciated until after a feat of most abstract reflection, and which simply transcends, without contravening, the process of our thought, while it lies in a superhuman realm of mystery where neither the philosopher nor the divine should rashly intrude. It has been fully discussed in the second part of the former volume.

Without further digression into these inquiries, we may now return to our position that a comprehensive theory of the sciences cannot be framed until we shall have at least surveyed and fairly estimated their metaphysical as well as empirical contents. The extreme empiricist will be ready to exscind from the material of such a science the theological doctrines that still stand in the way of his favorite hypotheses; as the extreme metaphysician will in like manner hasten to repudiate the scientific theories which seem to menace his cherished dogmas; but the true philosopher will impartially retain both the doctrines and the theories under judgment, notwithstanding any seeming breach or disagreement between them, and will reject neither, while yet any available evidence remains to be produced. In a word, he will proceed to construct his science of the sciences in a scientific spirit, and from a sincere love of the truth for its own sake.

The next chapter will be an attempt to meet this requirement by a survey of the sciences which shall include with judicial fulness and fairness every plausible hypothesis on the one side and every tenable dogma on the other, as well as all approved theories and accepted doctrines.

As a *third condition* of the proposed science—and one of prime importance—it should include not merely all the sciences and all their contents, but also all legitimate instruments and factors of knowledge in the metaphysical as well as empirical region of those sciences. Since one design of such a science should be to furnish an organon or body of

logical rules of scientific research and evidence, it would plainly be most unphilosophical to neglect or repudiate any trustworthy means of information or investigation, merely at the bidding of custom and prejudice, or because it had not the precision and force that might seem at first sight desirable; and such unphilosophical conceit and partiality would become flagrant, if displayed in a quarter where additional cognitive resources were especially needed. Now, it has been shown by distinguished writers on the philosophy or logic of the sciences, such as Comte, Mill and Lewes, that as we ascend the scale of the sciences our means of exploring them increase with their complexity and difficulty; that in astronomy we are limited to observation through one sense, and that sense mainly as armed with the telescope; that in terrestrial physics and chemistry we have observation through all the other senses, with the additional aid of experiment; that in biology, besides observation and experiment, we have comparison of organs and species; while in the mental and social sciences, where sensible observation, experiment and comparison can afford us but little aid, we have a direct personal consciousness and recorded history of the phenomena to be investigated. But this beautiful and luminous principle, according to the same school, must utterly fail us the moment we pass from the empirical into the metaphysical section of the sciences, and begin to deal with insensible realities, powers and principles. We then enter a region of "the Unknowable," where the human reason at once loses itself in endless contradictions, or can only grope by vague intuition or rash speculation, with no extraneous light and guidance. At the very point beyond which our senses cannot lead us, we are told that we have no other faculties or appliances of knowledge. Even Mr. Lewes, though he claims a large extra-sensible province of metaphysics as scientifically knowable, still insists that the supra-sensible world is wholly excluded from the field of research, and terms theologians and metaphysicians, mere "metempirical speculators." "All experience," he exclaims, "is against you; yet, if you have any means of proving the existence of an organ which grasps realities beyond those given through

sensible experience, we shall admit our error; but till this is proved, we must hold your efforts to be misdirected." And he adds, that any conclusions brought from that outlying region into the sphere of phenomena become amenable to the canons of empirical research. To all which the theologians and metaphysicians might reply: "We accept the challenge on the conditions named. All experience is *not* against us; the best experience of the race is with us; not merely the experience of a subjective intuition or illumination, but the experience of an objective revelation from the Infinite to the finite reason through both nature and scripture. And this divine revelation has been empirically verified in history, and may be logically correlated with the human reason as a complementary factor of knowledge throughout the metaphysical section of the sciences."

Let it be observed that we are not as yet discussing these questions. It falls within our present purpose only to state them as problems which must be met and solved by any philosophy which seeks to include and explain all the intellectual phenomena of humanity in history as well as consciousness. If philosophy be defined as the science of knowledge, it is plain that to determine whether there be a divine revelation, making known the otherwise unknowable, is a strictly philosophical question. It is as much a philosophical question as that of determining the validity, functions and limits of the human reason as a source of knowledge. And in the present speculative crisis it is the most pertinent philosophical question which could engage the attention of the scientific world. We have grown familiar with a subtle agnosticism which threatens to extinguish one of the very eyes of philosophy and paralyze an entire half of the body of knowledge. It claims to have demonstrated that the Absolute is unknowable, and a revelation therefore metaphysically impossible; and in some of the higher circles of thought and culture it accepts this result with a tone of complacent tolerance which should only proceed from assured knowledge. But all the while it is strangely forgetting, or more strangely ignoring, an immense mass of empirical proofs of such a revelation, which date beyond the earliest dawn

of science, which have been accumulating for thousands of years in the view of the most piercing intellects of every generation, and which may claim to be as scientific in their nature as the astronomy of Copernicus or the Principia of Newton. And now it is for the philosopher, from his independent point of view seeking all possible means of knowledge in the sciences, to sift this evidence and decide whether it is scientifically probable. He may do this, if he will, with no moral or practical intent, from the mere desire to ascertain the limits and means of knowledge as philosophically as if he were examining an essay on the human understanding instead of a treatise on the Christian evidences. If he rejects those evidences, he will at least have certainty where before he had only conjecture; but if he accepts them, it will then be in order for him to admit the duly-attested divine revelation as a legitimate factor of metaphysical knowledge, and proceed to adjust it to the human reason as a corresponding factor of empirical knowledge in the scale of the sciences.

If it be said that our evidence of such a revelation is confessedly not demonstrative, and as yet not certain enough to serve any philosophic or scientific purpose, though sufficient for the ends of religious faith—it may be replied, that it is evidence of the same kind, if not of the same degree, as that which upholds the entire fabric of experimental knowledge. It should be remembered that there are sceptics in empirical as well as metaphysical science who decry not merely our cognitive faculties, but the whole inductive procedure of reason. Professor Stanley Jevons concludes his logical discussion of the principles of science with the assertion that the certainty of our scientific inferences is, to a great extent, a delusion; that the uniformity of nature is an ambiguous expression, and the reign of law an unverified hypothesis; and that there is an infinite incompleteness even in the mathematical sciences. It is also well known that some of the most practiced investigators and successful discoverers have never mastered the logic which they unconsciously used in their researches. Yet this does not deter the philosopher from accepting the vast body of physical science which rests upon that logic. Nor does the fact that the logic of Christian

evidence, though ever increasing, is still incomplete, oblige him to discard that evidence, together with the whole mass of metaphysical truth which it sustains. He need not reject revelation or prejudge its contents because its credentials have not all arrived. He may even find the internal evidence strengthening the external, as well as the external enforcing the internal; science corroborating revelation and revelation completing science, as the two ever mount together toward the fulness of absolute truth.

Let him but once, on due evidence, admit revelation as well as reason into the sphere of philosophic inquiry, and his remaining task would not be difficult. He would find that in each science and through the whole series of sciences, the two factors of knowledge mutually limit, support and complement each other—reason predominating in astronomy, where comparatively little is revealable; revelation predominating in theology, where comparatively little is discoverable; while neither predominates in the midway science of psychology, where the discoverable and the revealable are more nearly balanced. And it would thus appear, that in the metaphysical as well as empirical region, our means of investigation increase with the difficulties which meet us, and that the sciences, instead of continuing as a mere medley of theories and doctrines, may be logically organized into a system of perfectible knowledge.

The second part of this treatise will be devoted largely to the task of meeting this second requirement of a complete philosophy by unfolding throughout the sciences the cumulative evidence of a divine revelation as a source of metaphysical knowledge and by exhibiting its logical correlations with human reason in the two provinces of inquiry.

PHILOSOPHY.

The Empirical Province of Human Reason.	Theology. Sociology. Psychology. Anthropology. Geology. Astronomy.	*The Transcendental Province of Divine Revelation.*

We are now ready to name the *fourth condition* of the

proposed science, and the last to be here mentioned: it should at length include revealed religion within the metaphysical realm of the sciences as their due metaphysical complement and the goal of their full development. This is little more than a summary of the terms already stated;—that divine revelation becomes an approved factor of metaphysical knowledge; that it largely occupies the metaphysical region with revealed doctrines in each science, both physical and psychical; that at the summit of the sciences it yields a revealed theology in growing consensus with the empirical theology of all religions; and that it there surmounts and completes the metaphysical hemisphere of the sciences. Were they thus complete, divinity would all but supersede metaphysic; scientific theories would be correlated with religious doctrines; revealed realities would take the place of notional entities; divine powers and purposes would be recognized in natural forces and causes; and at length Jehovah himself become not less intelligible than adorable as the Great First and Final Cause, the Absolute and Infinite Reason, the Alpha and Omega of the universe. In other words, according to the true law of the complete development of the sciences, they are *first positive, then metaphysical, and at last theological.*

In a brilliant chapter on the need of metaphysics, Schopenhauer defines man as a metaphysical animal; claims even the religions of mankind as but so many expressions of the metaphysical craving, as in fact the metaphysics of the million; and finds proof of his own idealistic pessimism, not only in Christianity, but chiefly in Brahminism as being at once the most philosophical and the most popular of the world's religions. Were all this granted, it would only strengthen the time-honored definition of man as a religious animal, since even when most metaphysical he is often most religious. While some speculative minds tend to make a metaphysic of their religion, others are fain to make a religion of their metaphysic; the former by explaining the universe on biblical grounds and the latter by resolving biblical doctrines into mere philosophic myths. On the one hand we have had metaphysical divines, postulating a premundane Trinity as their philosophic *prius*, speculating about the eternal substance

of the Father, generation of the Son and procession of the Spirit, and at length unfolding the true order of the divine decrees in creation and redemption, with a boldness that might seem rash were it not couched in Scripture phrase. On the other hand, we have had devout metaphysicians assuming an Absolute Ego or an Infinite Reason as their potential source of the intelligible universe, exposing its objective and subjective phases of self-consciousness, tracing its rational process throughout nature and history, and at last exhibiting the miraculous facts and truths of Christianity itself as but so many philosophic formulæ to be held in the very dialect of the schools. The few unmetaphysical divines and undevout metaphysicians who would destroy either metaphysics or theology, or strive to keep them asunder, may only serve as exceptions to prove the rule. The majority of thinkers are found holding a theology more or less metaphysical or a metaphysic more or less theological.

That philosophy should somehow thus embrace religion as well as science within its scope and assign to revealed theology its due place and function in the logical organism of the sciences has, in fact, long been a latent belief in the philosophic mind. Not only have theosophists, like Schelling and Swedenborg, sought to combine natural science with revealed religion; but strict philosophers, like Rosmini and Gioberti, have allowed a place in their systems for the super-intelligible and superrational, and their disciples have been proclaiming the synthesis or harmony of religion with science as requisite in a true philosophy. To such an ultimate philosophy, moreover, the Christian thinkers of all ages have aspired with more or less intelligence, and a clear presentiment of its inevitable approach may be said to have already arisen in minds of "large discourse, looking before and after."

Leaving the relations of philosophy and religion to be more fully unfolded as we proceed, we conclude this chapter of definitions with only a general view of their mutual interests and prerogatives.

It is important to begin with the relation of Philosophy to Religion. This has become apparent in every province of

religious science. *First:* In natural theology philosophy comes as a witness to prove the divine being and attributes, the divine government, the present state of probation, and future state of rewards and punishments. These are tenets common to all religions and logically prior, if not fundamental to revealed religion. The Pagan, the Deist, the Christian, Cicero, Herbert, and Butler, have been agreed in accepting them, and orthodox divines as well as devout philosophers, have ever employed the physical and mental sciences for their confirmation and illustration. *Second:* In apologetical theology philosophy appears as a judge to collect the evidences of Christianity, both internal and external, and estimate their logical value. It was long ago argued by Bishop Butler that reason, which is our only faculty for judging anything, is a proper critic of the evidences, though not of the purport or content of a supposed revelation, unless the latter be found plainly absurd or immoral; and all the great apologetes from the time of Justin Martyr have been striving to show that the Christian religion is reasonable as well as credible. But whether its miracles or its doctrines be put foremost in proof, both evidential schools, Chalmers and Mansel as well as Clarke and Wolff, have claimed to offer a more or less philosophical vindication of its truth and value. The countless works which have accumulated on the miraculous, prophetical, historical, scientific, and experimental evidences of Christianity remain as but so many philosophic judgments in its favor.

Third: In dogmatic theology philosophy is admitted no longer as a witness or a judge, but rather as a disciple and handmaid of revealed religion to learn its teachings and organize them into a logical system. Once inside an accredited revelation, reason herself is ready to accept mysteries and even paradoxes. But the truths of Holy Scripture, however clear to believing minds, are not given in scientific terms, and can only be formulated by the rational faculty as trained in schools of human learning and consecrated by the Divine Spirit. Accordingly, the fathers, the schoolmen, the reformers and the later divines have all proceeded more or less philosophically in their construction of the Christian

dogmas. Not only so, but the most peculiar mysteries of revelation, the trinity, the incarnation, the atonement, have found frequent expression and illustration in philosophical systems of purely human origin; so that the dogmatic theology still current is full of the ideas and terms of Greek, Roman and Arabian philosophy, as well as of the later schools of French, English and German thought. The names of Malebranche, Cudworth, Schleiermacher and Hodge are enough to suggest how largely theologians have made use of philosophical learning and speculation. *Fourth:* Even in polemical and practical theology philosophy may be of essential service in adapting revealed doctrines to the existing state of Christianity and civilization.

The relation of Religion to Philosophy, though not so obvious, is more important to our present purpose. It holds, according to any definition that may be employed. *First:* Philosophy, as the comprehensive science of things divine and human, embraces theology with the other sciences, and would remain forever incomplete without it. Religion is at least a conspicuous phenomenon to be explained, and the philosophy of religion a recognized branch of inquiry. Quite apart from their practical moment, the articles of natural religion are problems of speculative interest, which have tasked profound thinkers, like Spinosa, Hume and Kant; and even the dogmas of revealed religion, as treated by Bacon, Descartes and Hegel, have formed an integral part of human knowledge. The few philosophers, like Comte, who would ignore theology, have simply substituted some grotesque imitation in its place. Instead of being monopolized by professional divines, it is now pursued by archæologists and philologists, like Burnouf and Max Müller, who claim to have founded a new science of religions termed comparative theology, as well as by non-Christian writers like Strauss, Theodore Parker and Greg, who have been constructing ancient and modern faiths into a new philosophic creed of the future. So that, according to the principles of the latest classifiers of knowledge, theology, as we have shown, is at least entitled to rank as the last and highest of the empirical sciences. *Second:* Philosophy, as the science of absolute

being, requires religion on the transcendental side of the sciences for their own logical support and consistency. Separated from theism, the metaphysical ideas of causality, absoluteness and infinity can only appear vague and contradictory; but they at once become clear and congruous in the conception of an Absolute Will or Infinite Reason as the first and final cause of the phenomenal universe. Such a conception is not to be arbitrarily set aside as a mere anthropomorphic sentiment or superstition because it happens so largely to coincide with the religious belief of mankind. In the dry light of pure thought it affords a consistent theory of the world which has satisfied even atheistic and pantheistic metaphysicians, like Schopenhauer and Hegel, as well as theistic metaphysicians, like Descartes and Berkeley; while in practical research it has been used as a sort of rational postulate by great physicists, like Newton and Herschel, who have thus sought to give unity to their scientific knowledge. The agnostic school of Hamilton, Mansel and Herbert Spencer has simply been purging theology from that grosser anthropomorphism which philosophic divines have assailed from the time that St. Paul reproved it in a renowned assembly of Athenian philosophers. In like manner the pessimistic school of Hartmann and Bahnsen is but emphasizing the riddles of evil, pain and chance, which were long since met by revealed religion and can only be fully solved through its aid, as the younger Fichte and Ulrici have shown. And though the history of Christian gnosticism, as seen especially in the schools of Schelling and Marheinecke, has been full of mystical conceits, yet it serves at least to show to what extent the dogmas of creation, redemption and judgment have been philosophically employed in explaining the origin, development and destiny of the universe. Theology, therefore, besides being the highest of the empirical sciences, is also their metaphysical keystone and complement, without which they would fall into nescience and absurdity, and the chief problems of philosophy remain forever insoluble. *Third:* Philosophy, as the supreme science of the sciences, admits revelation as a correlate factor with reason in each of those sciences. Revelation, by its very definition, is complemental to reason, making known the

otherwise unknowable, and thus meeting our intellectual as well as moral necessities. The Christian revelation in particular is found to be a transcendental communication of divine wisdom, and as such has been largely employed by philosophers, no less than theologians, in supplementing and completing the purely rational portions of our knowledge. It is, in fact, the fitting reward of philosophy for her service to theology in demonstrating the authority of revelation, that she thereby supplies the exigency of reason, and so may connect the infinite mind of God with the finite mind of man throughout the realm of cognition. The few irreligious thinkers, such as Comte, Stuart Mill and Lewes, who have treated of the logic of the sciences in an otherwise luminous manner, have strangely overlooked, not merely the whole metaphysical domain of those sciences, but the existence therein of a conspicuous, objective revelation, historically attested by an immense mass of cumulative evidences as scientific in their nature, if not in their extent, as those which uphold the Newtonian theory of the solar system. And even Christian thinkers, the most learned in divinity, have yet to see more clearly the strictly philosophical value of that revelation in removing intellectual error and ignorance as well as moral and practical depravity, and thus perfecting science no less than religion. The truth is that philosophy, in order to accomplish its own highest aim and function as the science and art of knowledge, must begin by proving revelation and reason to be joint factors of knowledge, and then proceed to ascertain their normal, existing and prospective relations in the scale of the sciences, and to formulate the logical rules for organizing the existing medley of rational and revealed truths, theories and doctrines. In other words, the very foundations of a complete philosophical system must be laid partly in natural theology and the Christian evidences; and no one can foretell to what extent even dogmatic theology, as we now know it, may yet enter with the physical and mental sciences into the growing superstructure of the temple of knowledge. *Fourth:* Finally, in the most practical sense, philosophy or the pursuit of wisdom, as we have already maintained, needs the religious graces of reverence, docility and faith, together

with the more purely philosophical virtues of accuracy, candor and catholicity in all efforts after knowledge and truth.

With this general statement of the last and highest problems of philosophy, the object of the present chapter is accomplished. We have traced the history of previous attempts to classify human knowledge, and have examined the systems which survive in our day. The result is a scheme combining any just principles upon which they have proceeded, but more accurately and fully applying those principles to the existing state of scientific knowledge. The sciences have been arranged in a serial order, corresponding to the different classes of facts which they have themselves disclosed in their own progress. Theology, as well as psychology, has been added to the series and placed in its due rank and relations as an empirical science of religion. The empirical division of all the sciences has been put in connection with the metaphysical division in which they find their logical complement. And the whole series has been crowned with a terminal science of all the other sciences, designed for their organization and completion. Bringing all together into one view, we may picture the tree of knowledge as having its roots in logic and mathematics, its trunk ascending through the physical and psychical sciences with their several empirical and metaphysical branches, and its flower in philosophy as the science of the sciences, while its fruitage would appear in their correspondent arts.

With this scheme of the sciences in mind, we are now ready for that survey of their existing contents which is, according to our project, the next stage in the work of constructing the ultimate philosophy.

CHAPTER II.

SURVEY OF THE SCIENCES.

In the proposed survey of the sciences, we shall follow the order of our working classification of them, beginning with the physical sciences of astronomy, geology, anthropology, and proceeding through the psychical sciences of psychology, sociology and theology. The survey will embrace both the empirical and the metaphysical sections of each science, as we have defined them, the one on the rational side and the other on the revealed side of the series. And it will also extend to the full contents of each section, the problematical as well as the ascertained portions, not merely those opinions which have reached scientific completeness, but also those which are still hypothetical among scientists or dogmatical among divines. It is only thus that we may get before us all the data of a true science of the sciences.

Such a survey, it is plain, must be more or less historical, reaching back to the rise and growth of the sciences, as well as abroad over their present condition. Strictly speaking, indeed, we shall not attempt a full philosophical history of the sciences, showing their internal growth and connection; nor yet a full philosophical history of dogmas, showing their varied phases and relations; though an outline of both these histories must necessarily be involved. As we proceed, we shall simply be tracing in each science that great schism between rational and revealed knowledge which, for the last three centuries, has been gradually advancing; first, through a stage of healthful separation, marked by ascertained facts and truths; then, through a stage of unconscious avoidance filled with various hypotheses and dogmas; and at length to a stage

of avowed rupture issuing, as we have seen, in mere sciolism on the rational side and dogmatism on the revealed side, with a corresponding breach throughout all modern civilization. In other words, we shall be unfolding two parallel histories of the divided or dividing sciences as they will appear in three separate stages, more or less successive and chronological, according to the following scheme:—

HISTORICAL VIEW

OF THE RATIONAL AND REVEALED SECTIONS OF THE SCIENCES DURING THE LAST THREE CENTURIES.

1st Stage, A. D. 1700. Scientific Facts and Theories.	THEOLOGY. SOCIOLOGY.	1st Stage, A. D. 1700. Religious Truths & Doctrines
2d Stage, A. D. 1800. Scientific Hypotheses.	PSYCHOLOGY. ANTHROPOLOGY.	2d Stage, A. D. 1800. Religious Dogmas.
3d Stage, A. D. 1900. Science without Religion.	GEOLOGY. ASTRONOMY.	3d Stage, A. D. 1900. Religion without Science.

For the materials of these sketches we must rely primarily upon such general historians of science as the elder Morell, Playfair, Whewell, Cuvier, Comte, Pouchet, Humboldt, Lyell, Somerville, and upon such general historians of doctrine as Hase, Hagenbach, Dorner, Meyer, Hodge, Shedd and Krauth; but also and mainly upon the chief authorities in the different sciences, whose opinions will be found cited substantially in their own language, and usually in connection with the titles of their works.

In traversing so vast and tangled a wilderness of topics, we shall need to follow a somewhat precise method, even though at times it become wearisome. For the same reason it has been impracticable to sustain each statement with marginal citations and references which would often encumber the page with more notes than text. It is hoped that the survey may prove at least just and accurate enough for its purpose.

It may be well to premise a word of explanation in reference to the boundaries and connections of the several sciences to be surveyed. As our working classification is necessarily restricted to the actual state of scientific knowledge, it can only include those special sciences and provinces of science which are now under cultivation, what we have termed principal sciences in distinction from fundamental sciences. While astronomy embraces celestial physics, chemistry, organics, etc., geology includes chiefly the terrestrial province of those sciences, and anthropology mainly the human region of that province. In like manner psychology is divided from anthropology, sociology from psychology, and theology from sociology, as an empirical science of the religions unfolded by societies in history. Moreover, although the metaphysical section of each science is not always visibly, much less logically, connected with the empirical section, yet the survey must include both sections in order to be exhaustive and complete.

Leaving these distinctions to appear as we proceed, we begin with astronomy as the first of the physical sciences.

SECTION I.

Astronomy, Rational and Revealed.

In the rational section of astronomy, we shall find an approved theory of the heavens, which, for several centuries past, has been growing in scientific certitude. The first stage in its formation was that of abandoning the pseudo-biblical astronomy of the fathers and schoolmen. It was the time when the telescope was disclosing innumerable other worlds beyond the heaven of the church, and enthusiastic explorers were revolutionizing the whole popular conception of the universe. Nicholas of Cusa, as early as the fifteenth century, in his work styled "Learned Ignorance," had revived the Pythagorean notion of planets revolving around the sun, considered as the noblest of the heavenly bodies, the source of heat and light and the great central hearth or focus of the universe; but the suggestion seemed then so fanciful in the view of the orthodox astronomy, that it was treated

rather as a harmless paradox than as a heresy. Nicholas Copernicus, known as the founder of the solar system, in his celebrated treatise on the "Revolutions of the Celestial Orbs," propounding the conjecture of Cusa as a mathematical theorem, demonstrated the motions of the earth and planets upon their axes and around the sun, that great lamp of the world, placed in the midst of the temple of nature; deprecating the while not so much the attacks of astronomers as of divines, or vain babblers, as he terms them, who, knowing nothing of mathematics, yet assume the right of judging on account of some text of Scripture, perversely wrested to their purpose. Galileo, the first great astronomical discoverer, proceeding to verify the hypothesis of Copernicus by the telescope, announced in his "Sidereal Messenger" the satellites of Jupiter as a visible model of the solar system; whilst in his "Dialogues" he defended it with mathematical reasonings against the erroneous biblical interpretation which hindered its popular reception. The indomitable Kepler, by the extraordinary calculations in his great work on the "Motions of Mars," which he likened to a long battle with that planet, described the exact form and dimensions of the celestial orbits, and demolished the complicated crystalline globes which had been revolving around the orthodox horizon since the time of Ptolemy; advising that whoever is too weak to receive the Copernican system without harm to his piety, should leave the school of astronomy and worship God through his natural eyes, with which alone he can see. Sir Isaac Newton, the greatest of devout astronomers, in his immortal "Principles of Natural Philosophy," completing the researches of Copernicus, Galileo, and Kepler, with the discovery of universal gravitation, fully demonstrated that heliocentric system of the ancient Greeks which, after lying buried under the traditions of the Church, has now become the orthodox theory of Christendom. Euler, Clairvault, La Grange and La Place, together worked upon the mechanical problem of the solar system until they established its perfect harmony and stability by showing the very perturbations of the planets to be but periodical movements, like immense pendulums, beating ages for seconds. At length the two Herschels, Sir William and Sir

John, successively gauging the northern and southern hemispheres with the telescope, unveiled the very heaven of heavens beyond our solar firmament, as they resolved nebulæ into stars, stars into suns, and suns into galaxies, crowded together like golden sands, each grain a world, and so remote that ages must have sped, while the light flew which makes them visible to our eye. And since that time, other great astronomers, such as Bessel, Struve and Arago, Kirchoff, Secchi and Huggins have been occupied with the remaining problems of determining the different astral systems, the revolution of our own solar system among them, even their chemical constitution and phenomena, as disclosed by the spectroscope, and their probable combination in some one universal system, regulated by physical laws.

The second historic stage of separation, brought the gradual substitution of a hypothetical astronomy, in place of the true biblical astronomy, which still remained unharmed. The whole doctrine of creation being ignored, numerous speculations arose as to the origin, the design, and the destiny of the heavenly bodies.

As to their origin, there were two rival hypotheses. The one was that of a spontaneous growth of worlds. It had been held by Democritus and Lucretius that the original atoms struggling together throughout space and time, after infinite trials brought forth from chaos the existing universe as the fittest to survive the mazy conflict. And though the hypothesis had slumbered during the early and middle ages of the church, until it was revived by Bruno and Gassendi in the seventeenth century, yet it has since come forth again with renewed vigor and in more scientific forms. Descartes who is said to have been the first to indulge the pleasing fancy of making a world, in a "Treatise on the Universe," which was awhile withheld for fear of the fate of Galileo, but afterwards incorporated in his Principia, had proposed to show how the solar system, though created perfect, might have arisen on mechanical principles, from a series of vortices, or vast eddies of different kinds of matter whirling, under divine impulses, with the sun and planets, like boats in a maelstrom. Leibnitz, with more mechanical know-

ledge than Descartes, and greater philosophical boldness, applied his peculiar theory of monads in "A New Physical Hypothesis not to be despised either by the Copernicans or by the Tychonians," according to which the heavenly bodies were composed of self-acting atoms, ever propagating and sustaining, by their own impulses, the complicated revolutions of the solar system. Immanuel Kant, employing the more advanced physics of his day in his "General Natural History and Theory of the Celestial Bodies," attempted to account for the mechanical origin of the universe by supposing an immensity of attractive and repulsive particles, out of which the sun and planets have been developed. At length La Place, in his celebrated "System of the Universe," completed the speculations of Descartes, Leibnitz, and Kant by postulating throughout primeval space a luminous vapor or fire-mist which, as it revolved and cooled, became condensed, first into a central igneous body, like the sun; then into rotating rings, such as those of Saturn; then successively into gaseous and watery globes, like Jupiter and Uranus; and at length into solid shells, such as that which encloses the fiery core of our earth.

And these speculations were soon extended to the remotest stars and galaxies. Kepler, Kant, and Lambert had already argued, from their respective theories, that the luminous clouds floating in space were but relics of the material out of which the heavenly bodies had been formed. The elder Herschel, applying the hypothesis of La Place to the sidereal heavens, conjectured the unresolved nebulæ to be cosmical masses in the act of condensing into suns and planets, and even detected in some of them, by the telescope, supposed changes of structure, lucid points glittering as the nuclei of new worlds, or rather of ancient worlds, so remote that ages must elapse ere the tardy light can paint their finished form in the eye of man. Henry Schubert, who adopted for a time the views of Herschel, in his treatise on the "Primitive World of Fixed Stars," poetically likened these new-born worlds to great golden birds coming forth from the egg, or still covered with parts of the shell, remaining from the unconsumed nebulous matter. Alexander Humboldt, in

his "Cosmos," describes the whole starry heavens as a vast nursery of worlds, teeming with the greatest variety of cosmical productions, as trees in a forest are seen coexisting in all stages of growth, and maintains that the celestial spectacle is only in appearance simultaneous and without perspective, having beyond it an endless succession of stars and galaxies too distant to be portrayed as yet in other than their embryo forms, as mere films and dots of light. Johannes von Gumpach, in an elaborate work entitled "Baby-Worlds," even attributes organic life to the heavenly bodies, describing comets and nebulæ as the infant members of the planetary family, and heirs apparent to the solar empire. Professor Proctor also, in his recent Lectures, holds to a literal birth and growth of planets and suns by an accretion, rather than contraction of nebulous matter as massed in solid nuclei and fed by meteors, comets and star-dust, at a rate so slow that the earth could not have grown more than an inch in many millions of years. And the latest advocates of the nebular theory now claim that the spectroscope is actually verifying it by exhibiting in the chemical constitution of different stars all the successive phases of cosmic growth, nebula, sun and planet, as plainly bursting into life throughout the heavens, as the germ, leaf and flower at our feet.

But the other hypothesis was that of a fixed series of worlds. It had been taught by Plato and Cicero, as well as the fathers and the schoolmen, that the universe was originally created as a cosmos or mundus; and ever since has remained in its finished order and beauty. And upon this doctrine not a few modern astronomers have proceeded in their cosmical speculations. Galileo, even in advance of the telescopic resolution of nebulæ, refused to believe them other than distant clusters of stars. The elder Herschel himself, though he finally adopted the opinion that they were mere remnants of our own solar or astral system, drifting within the visible heavens, had been at first inclined to regard them as extremely remote galaxies outside of the milky way, and not yet in reach of the telescope. The younger Herschel, advancing beyond his father's explorations to the conclusion that all nebulæ are but clustered suns, a sort of star-dust of worlds, suggested that

the coexistence of a series of organized suns and planets, in different stages of relative perfection, does not necessarily imply transition and development, if we suppose all progress in the present state of nature to have long since reached its end, as we see among the animal species. Schubert, who passed from the elder to the younger Herschel, in his "Fabric of the World," described the various forms of nebular and stellar systems, through all their grades, as but parts of one vast coordained whole, which, like the organic scale from the mollusk to the mammal, may have originated together, and henceforth subsist side by side. Professor Lamont of Munich, an eminent observer in the same field, argued from the oldest sources of information as to the condition of the heavens, that the whole cosmical structure, after some sort of a formative period, has long since passed into a state of sustained equilibrium, and all-preserving order, like that which La Place has shown to exist in our solar system. Mädler, the distinguished astronomer of Dorpat, reasoning from the same analogy of the solar system, in his work entitled the "Central Sun," has challenged the posterity of astronomers to the problem, that the whole sidereal heavens from the outermost nebulæ will be found to include a series of concentric galaxies or zones of suns and planets circling, together with our own little system, about a preponderating cluster of suns, or common centre of gravity in the imperial group of the Pleiades, near the bright star Alcyone. And it may be that the spectroscope will yet combine with the telescope to show that the order and variety which obtain upon earth, are but reflected throughout the heavens in countless species of worlds, ranging from the unformed nebula that wanders on the verge of space up to the most richly garnished planet that careers around the brightest sun.

As to the design of the heavenly bodies, two opposite hypotheses also arose. One was that of a plurality of inhabited worlds. Newton and Bentley treated this natural suggestion as a grave question of science. Christian Huyghens, the distinguished Dutch astronomer, bequeathed to the world as his best legacy, a "Cosmotheoros," or Theory of the Universe, containing ingenious conjectures with regard to the

celestial orbs, their garniture, the inhabitants adapted to their structure, and even their moral as well as physical condition. Sir William Herschel, more recently, in the "Philosophical Transactions," inferred from the climate and scenery of the moon, that it must be inhabited like our earth, and agreed with Arago in characterizing the sun as richly stored with inhabitants dwelling upon an opaque globe behind his dazzling photosphere. Dr. Lardner, in his "Museum of Science and Art," argued, from the analogy of the polar and tropical zones of our globe, that the outer planets farthest from the sun, Jupiter, Saturn and Neptune, as well as the inner planets, are tenanted with races closely resembling, if not identical, with those with which the earth is peopled. Professor Owen, the distinguished naturalist, in his work on "The Nature of Limbs," still more profoundly reasoned from the doctrine of archetypes or ideals, as well as from the mechanism of the sun and satellites, that the inhabitants of the planets may be organized on the vertebrate type, affording numerous conceivable examples not realized in this little orb of ours. Sir Humphry Davy, in his "Consolations of Travel," imagined that he saw in the planet Saturn highly organized beings, whose gifted intellects were endowed with membranous bodies and convoluted probosces, as organs of exquisite sensibility and perception. And these bold conjectures have been pushed into the remotest stellar worlds. Sir John Herschel, by his telescopic resolution of nebulæ into suns, believed himself simply to have unveiled a populous immensity too bewildering for mortal fancy, and even speculated upon the probable scenery of those distant seats of intelligence, as reflected in a starry kaleidoscope, varied as the flowers of spring and more brilliant than the most superb jewelry. Schubert, following Herschel with still more exuberant fancy, contrasted the ponderous globes of our solar system, as swayed by antagonistic forces, like crude, massive machinery, with those harmonious spheres of light whose etherial inhabitants bask under a thousand suns, know neither day nor night, nor birth nor death, and are forever strangers to terror, to sickness and to tears. The great Danish naturalist, Oersted, by the profound conjectures in his treatise on "The Soul in Nature,"

peopled the mighty amphitheatre of worlds, from our little planetary group up through the circling suns and galaxies, with corresponding orders of intelligence, ranged in different stages of cosmic development, and together forming one universal organism of reason. Professor Proctor, in his "Other Worlds than Ours," has recently conjectured from the heat and light of the stars that, like our sun, they are encircled with life-bearing worlds, which they nourish; and that even the works of intelligent creatures may be going on in the planets of Vega, Capella, and the blazing Sirius. M. Flammarion, in his treatise on Celestial Marvels, not only argues from physical analogies that the planets, like the earth, are kindled by the sun into seats of life and thought, but dilates upon the magnificent scenery of other solar systems in Orion and Cassiopea, whose blue and red and green suns must produce for their attendant orbs a succession of brilliant days through all the colors of the spectrum. And indeed, with the telescope and spectroscope already unfolding the mechanical and chemical constitution of the most distant planets and stars, it would seem not at all incredible that the question of their organic character or habitability may yet somehow be brought to the test of physical investigation.

But the other hypothesis was, that our earth is the only habitable world. And it has not been without some distinguished advocates. Galileo seems to have treated the notion of planetary races as a mere jest rather than as a scientific hypothesis; perhaps, however, because his enemies were inclined to treat it as a heresy. Kepler, with no such restraints upon him, in his translation of Plutarch's "Dialogues on the Face of the Moon," indulged in sportive reflections upon the inhabitants of that satellite, which he named Levana. Fontenelle, in his elegant "Conversations on the Plurality of Worlds," popularizing a pleasantry which Lactantius had assailed in the writings of Lucian, entertained the wits of Paris with lively disquisitions on the scenery of the neighboring planets, and the Martial, Mercurial, Jovial, and Saturnine character of their respective inhabitants. Voltaire, in one of his satirical romances, represents the secretary of the Academy of Sciences in the planet Saturn setting out on

a philosophical tour of the universe with Micromegas, an inhabitant of the Dog-star, after mutually complaining of their limited means of knowledge, though the one had seventy senses and the other a thousand.

And it was not long before this ironical treatment of the subject began to assume the form of a scientific scepticism, with advancing knowledge of the physical characteristics of the different heavenly bodies. All astronomers have probably maintained, with the elder Herschel, that comets and asteroids are incapable of sustaining organized life, being mere fragments of the original nebulosity or globules not yet condensed into a habitable orb. The younger Herschel admitted, what has since been proved, that the moon at least is destitute of anything like human existence, having a mere volcanic surface, without air or water. Professor Pfaff, in his work on "Man and the Stars," whilst attributing a highly refined organization to the stellar spheres, regarded the planets around us as mere inchoate worlds, at most possessed of inferior plants or fantastic creatures, and serving no higher purpose than luminaries to our earth. The late Dr. Whewell, now known to be the author of the anonymous "Essay on the Plurality of Worlds," startled scientific circles with the theory that our planet is the only world in the universe; that it revolves in that temperate zone of the solar system between the extremes of heat and cold, where alone high organic life is possible; that the outer planets are mere globes of water and ice, while the inner are composed of cinder and slag; and that the sun itself is but the molten nucleus of a primitive nebula, whose gaseous fragments, long since extinguished, now only shine, like the corruscations of a fire-wheel, in the form of comets, meteors, and stars. Professor Winchell, in a little treatise on the "Geology of the Stars," has argued from recent spectroscopic researches, that suns are but condensed nebulæ or incandescent mist; that planets are more advanced worlds than suns, having gradually cooled and become encrusted with strata; that the nearer planets are still the abodes of monsters, such as once tenanted our earth, before the appearance of man; and that the older planets have already passed the habitable stage, the moon remaining but as a sort

of fossil world or ancient cinder suspended in the heavens. Professor Proctor also has suggested that we have no right to assume that every instant in the history of a world should be made available for intelligent life, but that in fact the chances are millions of millions to one against any special planet being inhabited, if we judge by the analogy of the brief time during which man has appeared upon the earth. And certainly geology may unite with astronomy in suggesting that the climatic transformations of different globes, as they change their axes and orbits, must involve corresponding cycles of life and death; a kind of metempsychosis of worlds, so that but one or a few of them could become habitable at a time.

Besides these questions, the destiny of the heavenly bodies has also been a fruitful theme of speculation. Some astronomers have favored the notion of a final chaos. Newton had very early expressed his conviction that without some divine interposition, the accumulating perturbations of the planets would ultimately bring the whole system into confusion, and speculated upon the dangers of a collision with comets, on the supposition of their enormous heat and solidity. Halley deprecated the approach of the great comet of 1680, as likely to crush the earth or change the seasons; and on the assumption that the celestial orbits are contracting slowly through the resistance of an etherial medium, anticipated a time when the planets would be drawn into the sun, and the whole existing order be remanded to the ancient chaos. And these views, in later times, have received still more scientific expression. It has been maintained by such physicists, as Helmholtz, Grove, and Tyndall, that all material forces, mechanical, thermal and vital, with their actions and reactions, must gradually tend to equilibrium and rest; that perpetual motion in the machinery of the heavens is as impossible as in any mechanism upon earth; that the friction of the planets and the cooling of the sun will ultimately cause them to be precipitated upon each other and, through their collision, dissipated into the igneous vapor from which they sprang; and that, consequently, without some infinite miracle, all other suns and galaxies of suns, as they sweep with diminishing force around the dreadful vortex, must at length be whelmed in a general

wreck of matter and crush of worlds. Professor Stephen Alexander has argued that the very forms of the nebulæ and clusters, such as the broken ring, spiral and fire-wheel, indicate a stupendous process of mechanical disruption and dispersion throughout the whole sidereal heavens. And Professor Winchell, in his "Sketches of Creation," describes the awful catastrophe which must ensue when the last man shall gaze upon the frozen earth, when the planets, one after another, shall tumble, as charred ruins, into the sun, when the suns themselves shall be piled together into a cold and lifeless mass, as exhausted warriors upon a battle-field, and stagnation and death settle upon the spent powers of nature.

Other astronomers, however, have leaned toward the notion of a permanent cosmos. La Place, in opposition to the conjectures of Newton, claimed to have mathematically proved that the secular agitations of the moon and planets, instead of being cumulative and destructive, were periodical and conservative, absolutely ensuring the stability of the solar system, unless there should be some foreign cause of disturbance. Arago maintained that no such disturbance could arise from the incursion of comets, the periodical return of which Halley and Clairvault had predicted and verified, whilst the discovery of their transparent, vaporous nature was fitted to dispel all fears of disaster, even in case of their collision with the earth. Mrs. Somerville, in her "Connection of the Physical Sciences," has suggested that the supposed etherial medium could not retard the primitive momentum of the planets, unless that medium itself be rotating in a contrary direction, as seems to be the case with the retrograde comets, and that the different sidereal systems, so far from deranging our own solar system, may themselves be revolving with it around a common centre of the whole creation as the only point of absolute and eternal repose. And to this idea of a universal mechanical equilibrium has been added one of a thermal or chemical nature, ensuring periodic variations of heat, light and life amid all secular inequalities, the ebb and flow of a vis viva of the universe, which is itself a constant quantity. Some modern physicists have accordingly denied that there is any such uncompensated cooling and shrinkage of the planets as would ulti-

mately destroy their life-bearing powers. Mayer, the great German physicist, in his essay on Celestial Dynamics, has maintained that the sun itself is like an immense furnace, ever gaining as well as losing heat, through a supply of cosmical matter, raining down upon it from the interplanetary spaces in the form of aerolites, meteoric hail and luminous dust, becoming visible to the eye as the zodiacal light. Poisson hazarded the bold conjecture that the entire solar system, as it careers amid myriads of blazing suns, instead of journeying toward night and death, may be passing through hot and cold regions of space, and possibly revolving between extremes of temperature, like the summer and winter of our earth, but through inconceivably vaster cycles, with ever changing climates and histories. And it has even been fancied, what indeed almost paralyzes fancy itself, that the evolution of nebulæ into planets, and dissolution of planets into nebulæ, which is supposed to be occurring throughout infinite space and time, may itself be periodic rather than catastrophic, a sort of normal birth and death of worlds, amid which man sports upon the earth like the merest animalcule of a bubble, vanishing in the sunshine.

If we now bring together the various speculations as to the origin, development and destiny of worlds, we shall have a problem which must only elude us in the effort to grasp it. According to the theory of universal evolution, the stellar and solar portions of an original nebula composed of homogeneous matter and force have been advancing with increasing multiformity from one stage of cosmic growth to another toward such a complexity and refinement as we find in our highly organized planet. But analogy also teaches us that this stupendous evolution of suns and satellites must have a corresponding dissolution, and it may even lead us to imagine endless cycles of evolution and dissolution, from cosmos to chaos and chaos to cosmos, unfolding universe after universe throughout immensity and eternity. In pursuing such a problem we soon come to the confines of the empirical astronomy and enter the metaphysical region of the science where we are wholly lost without the revealed doctrine of an absolute creator and upholder of the heavens and earth.

Astronomy, in its empirical section, is thus found to contain not only much exact knowledge of the heavenly bodies, but also a medley of hypotheses more or less scientific in their nature. As we have seen in the first volume, these hypotheses are in seeming conflict with certain dogmas on the revealed side of astronomy. It is to be observed, however, that the chief scientific authorities are not committed exclusively to any one of these hypotheses as against the others, but are so evenly divided among them as to leave it an open question which of them will prevail or whether each of them may not contain elements of truth yet to be sifted and blended in approved theories. Until thus fully tested, they must remain in our third stage of mere empirical science as detached from revealed religion.

Passing now into the revealed section of astronomy, we shall there find corresponding departures from the rational theory of the heavens. It was by like stages also that this mere separation grew into a schism. The first stage was that of abandoning the false scientific astronomy of the fathers and schoolmen. It should be remembered that Nicholas of Cusa and Copernicus were themselves orthodox divines, as well as scientists, and that the chief reformers aided in freeing the astronomical portions of the Scriptures from the mediæval superstitions of astrology and divination. Luther, though he still held the Ptolemaic notion that the firmament was a crystal globe turned swiftly around the earth by some angel, denounced the star-peepers and horoscope mongers who plead Scripture authority for their haphazard work and idolatry. Calvin, in his Genesis, defended the Mosaic doctrine of the signs of heaven for their chronological value against the Chaldeans and fanatics, who divined everything from the aspects of the stars. Turrettin, through a whole chapter of his "Institutes of Theology," reasoned elaborately against a prevalent Scriptural argument for judicial astrology, as the art of prejudging human events by the constellations was then termed. The Westminster divines, in their "Annotations" upon Genesis, though excluding the Copernican theory as not yet sufficiently demonstrated, still

admitted its consistency with the Mosaic system, and emphasized the doctrine of creation as both an article of faith and a maxim in philosophy. And gradually, with advancing science, by a line of astronomical theologians, from Derham to Chalmers, the way has been opened for redefining the whole doctrine of the heavens, considered as a divine creation and the abode of the Father and the angels.

But, in the next more questionable stage of indifference, still remained numerous dogmatic divines apparently unconscious of the new scientific astronomy which was emerging. The great mass of Greek and Roman doctors, as well as Jewish rabbins, simply adhered to the traditional dogmas respecting the creation, the angels, and the new heavens and earth; and even Protestant theologians betrayed but little knowledge of current astronomical discoveries and speculations. As to the doctrine of creation, for example, all classes were still substantially agreed with the fathers and schoolmen. Roman Catholic divines simply re-affirmed the ancient teachings of the church. Clement of Alexandria, with the other Greek fathers, and in opposition both to the Stoics and to the Epicureans, had delighted to represent the creation of the world as a voluntary act of God's love, not for His own sake, who needed nothing, but for the sake of the human race alone. St. Augustine, in his Confessions, had more precisely taught that God was the author of time, as it could not exist before creatures to measure it; that in the beginning He fashioned the heavens and earth, not out of Himself, but of nothing; and that He created them from no necessity, but of His own free will and for the good of man. Thomas Aquinas also, agreeing with Augustine, maintained that God willed from eternity that the world should be and not that it should be from eternity; that with the world He created both space and time; and that His design was the communication to His creatures of His own perfection as the highest expression of His goodness. Hugh of St. Victor held that God was not the mere former but the author of matter; and since the Creator was self-sufficient and man the last to be created, we receive both the good beneath us and the good above us, the former to supply our necessities and the latter to constitute our happiness.

And the same general views were re-affirmed by Suarez and Malebranche. It will be seen how readily such a doctrine could be connected with that Ptolemaic or geocentric theory of the heavens, which placed man in the midst of the world, as the final cause of the whole creation, with sun, moon and stars around him for the mere lights of his dwelling.

Protestant divines, whilst holding similar opinions as to the origin of creation, endeavored to define more precisely its mode and design. Melancthon, in his "Common Places," opposed the Stoical notion of eternal matter by representing the creative act as a simple fiat, commanding things to be which had not been before. Calvin, in his "Institutes," maintained that the actual work of creation was accomplished not in a moment, but in six days, in order to demonstrate that the heavens and earth were made for the sake of man, like a large and splendid mansion gorgeously constructed and exquisitely furnished. The Westminster divines, in their Confession of Faith, declared that God in the beginning, by the word of His power, made of nothing the world and all things therein, for Himself, for the manifestation of the glory of His eternal power, wisdom, and goodness. And Jonathan Edwards, in his profound "Dissertation concerning the End for which God created the World," argued elaborately from reason and Scripture, that the divine glory, the manifestation of the divine perfections, must have been the motive of the Creator, rather than the mere holiness or happiness of His creatures. It was too soon as yet, perhaps, to complement such a doctrine intelligently with that Copernican or heliocentric theory of the heavens which placed man upon a planet, as but an insignificant part of the creation, with countless worlds around him illustrating the glory of the Creator.

As to the doctrine of angels, there was not in all respects such full accordance. Roman divines continued to accept the patristic and scholastic definitions. The Nicene fathers, such as Basil, Ambrose, and Gregory, had ascribed to the angels a certain corporeity composed of ether or light, in accordance with their dazzling appearance as depicted in the Scriptures, and had referred them to the invisible world in distinction from that which is visible and earthly. St. Augustine had

taught that angels were the light created before all other creatures, having no superior but God, as men have none inferior but animals. The Council of the Lateran defined three classes of creatures, successively made in the beginning, first the spiritual or angelic, then the corporeal or earthly, and afterwards the human, composed of both body and soul. Gregory the Great, accepting the "Celestial Hierarchy" of Dionysius, which embraced three great orders, with three classes in each order, entitled them Angels, Archangels, Virtues; Powers, Principalities, Dominations; Thrones, Cherubim, and Seraphim; and likened them to the nine precious stones of paradise mentioned in Ezekiel. Peter Lombard, in his "Sentences," identified the creation of the heavens as the creation of angels, who were prior and superior to the whole material or earthly creation, and assigned them their place of abode above the visible firmament. Aquinas also characterized them as pure intelligences or intellectual substances not united to bodies, and indulged in subtle disquisitions upon the locality and scenery of heaven and hell, which he referred respectively to the upper and nether hemispheres; assigning to the constellation of the Little Carriage, or Great Bear as it is now termed, the marvellous function of transporting the souls of baptized infants to paradise, unless the rite had been imperfectly administered, when one of the wheels would break and the hapless spirit fall into purgatory. The great Catholic poet Dante, in his "Divina Comedia," simply illustrated the affinity of this celestial hierarchy with the Ptolemaic system by depicting the different orders of saints and angels in concentric zones, ascending through the planets toward the empyrean, or abode of the Virgin and Holy Trinity, with corresponding orders of lost spirits and demons descending into the under world. And the same dogmas substantially were decreed by the Council of Trent at the Reformation, and vindicated by Bellarmin and Bossuet.

Protestant divines, except as respects the worship and mediation of angels, which they rejected, were less precise in their opinions. Not only was the existence of purgatory both as a place and a state denied, but the material scenery and garniture of heaven and hell, in relation to the earth, were but

vaguely apprehended, and seldom blended with astronomical conceptions. There was simply a general agreement as to the spiritual nature, the immense number and the varied ranks of the angelic host, and their priority to man in the creation; and they were locally distributed, in accordance with the Ptolemaic system, in vague regions above and beneath, evil angels being confined in a bottomless abyss amid utter darkness, whilst good angels remained entranced before the throne of God in the third, or highest heaven, over the blue atmosphere and the starry firmament, except as either class occasionally visited the earth on errands of mercy or malice. The great Puritan poet Milton, in his "Paradise Lost and Regained," consistently with the existing state of astronomical knowledge, adhered to the geocentric and anthropocentric view of creation, by placing the earth, with tributary sun and planets, on the verge of chaos, midway heaven and hell, and representing man as the prize in a conflict of the supernal and infernal hosts, led by Christ and Satan. And probably, in the absence of more definite confessional statements, these were the prevailing opinions concerning the relation of the angelic races to the astronomical universe.

As to the new heavens and earth predicted in Scripture, there was a general agreement of all Christian divines with traditionary teachings, scholastic, patristic, and rabbinical. Even heathen sages, who may be supposed to have shared in this primitive revelation, such as the Chaldeans and Egyptians, had anticipated a final conflagration and renewal of the world at the time of a great conjunction of the planets in the constellation Cancer, to which sign of the zodiac it was supposed they would return, after revolving through the Annus Magnus, or Great Year, now known as the precession of the equinoxes. The Jewish rabbins, without any such astrological conception of the doctrine, have understood the prophetical descriptions of Isaiah and Ezekiel, as to the waxing old and passing away of the heavens and earth, to portend not merely the downfall of empires and nations, but an igneous destruction of the whole material creation, to which Philo added the ideas of its purification and restitution, though without admitting the office of fire in the process. The Greek fathers, such as

Clement, Origen, and Basil, in a somewhat rhetorical manner, associated the general conflagration, predicted by St. Peter, with the final judgment and new heavens and earth; attributing to its flames a renovating as well as punitive agency, a sort of purging of the whole material system from the dross of sin; whilst the Latin fathers, such as Augustine and Gregory the Great, by reserving the purifying fires in the underworld of Hades during the intermediate state until they should burst forth in the day of perdition, prepared the way for the dogma of purgatory. Aquinas, and the schoolmen generally, dwelt with theological subtlety upon the terrific imagery of the Scriptures respecting the end of the world, such as the darkening of the sun and moon; the falling of the stars; the sudden descent of the Son of Man in effulgent glory, with the whole angelic host surrounding Him, bearing His cross before Him, and blowing the trump of resurrection; the concourse of the dead rising from their graves to meet Him in the air; the judgment and destruction of the wicked amid the flames of dissolving nature, and the triumphal ascent of the righteous through the angelic ranks into the highest heavens. Paintings by the great masters, portraying the terrors of the last day, and hymns of the judgment, such as the "Dies Iræ," full of the wildest pathos, were but the artistic expressions of a dogmatic creed which pervaded the whole mediæval culture; and any unusual appearance in the heavens, such as a comet or meteoric shower, was enough to kindle the popular foreboding into dismay and panic, though as yet there could be no definite scientific conception of an astronomical catastrophe.

Protestant theologians retained the same opinions, without the notion of purgatorial fires. Some of them, indeed, as Quenstedt, defined the consummation of the world as an act of God by which the whole material universe, and all that it contains, except angels and men, is to be totally annihilated by fire, for the deliverance of the saints and the glory of the divine power and justice. Gerhard, without defending such a doctrine as an article of faith, or claiming for it the authority of the fathers, held it to be exactly conformed to the words of Scripture, and preferred to await the event itself without determining more precisely its character. Other divines, how-

ever, were not only inclined to restrict the catastrophe to a portion of the creation, to our own region of the astronomical heavens, the solar system or the earth and its atmospheric firmament, but regarded it, moreover, as involving a restoration or reconstruction of the world, an alteration of qualities and not an abolition of substance, the resurgence of the new heavens and earth, phœnix-like, from the ashes of the old extinguished creation. The heavens now wear their work-day clothes, but will then put on their Sunday garb, said Luther, in obvious allusion to the Psalmist's prediction, that they shall wax old as a garment and as a vesture shall be changed. Calvin, commenting upon St. Peter, insisted that the heavens and earth are to be purged by fire, that they may correspond with the kingdom of Christ, consumed only that they may be renovated, their substance still remaining the same. Turrettin, in one of his chapters, vindicates the same doctrine, with copious proofs from the Scriptures, the fathers, and even heathen writers. Millenarian divines, especially in times of political commotion, as during the English revolution, represented the destruction of the world as hourly impending in connection with the Second Advent of Christ. And these opinions, as everywhere expressed in sermons and hymns, when not pushed to a fanatical extreme, could not fail to produce a salutary impression of the transitory nature of all visible things. It will be remembered that astronomy had not yet advanced to the point where it could suggest the remarkable agreement of such predicted moral events with cosmical phenomena and tendencies, and they were, therefore, anticipated as mere celestial pageants or miraculous catastrophes from a geocentric point of view. This is still the popular conception of them; nor, indeed, can their dogmatic definition as yet be said to involve anything like scientific prevision as well as inspired prophecy.

We have thus fully surveyed the facts and the truths, the theories and the doctrines, the dogmas and the hypotheses which have been accumulating for the last three centuries and together make up the empirical and metaphysical contents of the science of astronomy as rational and revealed.

SECTION II.

Geology, Rational and Revealed.

In geology we shall find a similar distribution of its contents. On the rational side there have been successive departures from the revealed doctrine of the earth. The first and legitimate stage was that of expelling the false biblical geology of the schoolmen and divines. It was the time when bold navigators were sailing beyond the Christian geography of Cosmas, brave physicists were exorcising the long-forbidden alchemy, and the fossils of the museum were refuting the cosmogonies of the cloister. The practical geographers, Marco Polo, Columbus, De Gama, and Magellan, in spite of the anathemas of the church, had proved the vast extent and globular form of the earth. Boccaccio, the great Italian poet, at the very dawn of letters, in one of his romances, had taken the first step in palæontology, by describing the fossil shells in his native Tuscan hills as relics of a former sea, when as yet the Church was still defending them as mere illusory archetypes of the Creator, or sports of nature. John Baptist Porta, the Medici, and other Florentine academicians, under the ban of the church, led the way in the geological sciences of meteorology, physics, chemistry, botany, and mineralogy. Leonardo Da Vinci, who had been an engineer before he became a painter, and had discovered various organic remains whilst excavating a canal in Northern Italy, ridiculed the scholastic conceit that they could have been produced, together with accompanying pebbles and seaweeds, by some mysterious action of the stars. Fracastoro, the celebrated poet-physician of Verona, early in the sixteenth century, three hundred years ahead of his time, boldly assailed the traditional dogma, that the petrified shells of the Appenines had been carried thither by the Mosaic deluge, which he maintained was too transient to have buried the productions of the sea so deep in the mountains. Conrad Gesner, surnamed the Pliny of Germany, included among his voluminous works a treatise on "Fossil Objects," which he delineated according to their figures and species, but without deciding

whether they were animal remains or mineral products, as the learned were then maintaining. Bernard Palissy, a worthy forerunner of Cuvier, who collected the first cabinet of Natural history at Paris, and endeavored prematurely to connect chemistry with mineralogy, not only recognized the animality of fossil shells, but argued from their delicate and fragile structure that they could not have been transported by rough seas, but must have lived and died in the hills where they are found. Fabio Colonna, an eminent botanist, in his treatise on "Glossopetræ," the name of certain gems resembling the human tongue, carefully discriminated the external marks of fossils and the living species to which they had belonged; whilst the great naturalists of his time were still collecting them in the Vatican cabinet as mere curious petrifactions, or mineral growths, or volcanic excretions, or aqueous deposits, or other anomalous formations. Nicolaus Steno of Copenhagen, naturalized as a medical professor at Padua, published a work on the Contents of Solid Rocks, in which he demonstrated the organic nature of certain Italian fossils by classing them with living Mediterranean shells, and also traced the different stages of fossilization from the empty mould to the petrified animal. Robert Hooke of the Isle of Wight, the distinguished rival of Newton, as appears from his posthumous works, not only maintained that the figured stones were real organisms or their mouldings left in rock, but also suggested that some of them had belonged to extinct species, and even characterized them as ancient medals of nature, out of which it might not be impossible to construct a chronometry of the earth. William Woodward, founder of the geological chair and museum at Cambridge, which still bear his name, early in the eighteenth century, broached the principle of stratification, by arranging the stones of Britain in horizontal layers, the like of which, he predicted, would be found on the continent and even in remote countries. The learned Professor Vallisneri, author of the first complete sketch of the Italian strata and fossils, besides refuting the grotesque speculations of the Cambridge divines as to their diluvian origin, protested against the dogma of St. Jerome, that the disordered state of the earth's crust exhibited the wrath of God for the sins of

man, and proposed to explain geological phenomena by natural causes without violence and without miracles. Count Marsigli, a distinguished geographical explorer, and Vitalian Donati, the celebrated naturalist, after separate dredgings, published physical histories of the Adriatic sea, in which shells, corals, and fishes, both fossil and living, were displayed in genera and species or, as the latter writer quaintly termed them, in legions, cohorts, and centuries. Lehmanr in the mines of Germany, Arduino among the volcanoes of Italy, Demarest in the hills of France, Saussure amid the glaciers of the Alps, and Pallas upon the mountains of Siberia, together share the honor of classifying the strata according to relative age and position as primary, secondary, and tertiary, or ancient, intermediate, and recent. Baldassari and Soldani completed the organic scale of fossils from the animalcule to the mastodon, and Gesner, Brander, and Werner had already begun to arrange them in the successive strata as connected mineral, vegetable, and animal systems. William Smith, the father of English geology, a civil engineer without rank, wealth, or scientific correspondence, then completed the unknown labors of his predecessors by surveying the fossil beds of all England, and tabulating them in his work entitled "The British Strata identified by Organic Remains." Baron Cuvier, the great French naturalist and father of palæontology, at the close of the last century, having distinguished the fossil from the Indian elephant, after twenty-five years of extraordinary labor, published his great treatise on the "Organic Remains in the Vicinity of Paris," in which the most gigantic creatures, like fabled monsters of the land and sea, re-appeared in complete skeleton and form as by some magical resurrection. Adolphe Brongniart, the worthy collaborator of Cuvier, in his "History of Fossil Vegetables," in like manner restored the huge flora of the ancient world, with general views of the contemporaneous climate and scenery, like glimpses of fairy land. D'Orbigny, Pictet, Von Buch, and Phillips descended still deeper through the catacombs of nature, from one extinct dynasty to another, till they reached in the metamorphosed rocks the very dust of buried worlds as remote in time as are the nebulous stars in space. At length Carl Ritter, the

founder of physical geography, in his magnificent work, "The Science of the Globe," treating the earth as a star among the stars, traced its forming continents and seas as the destined theatre of human races and civilizations. And a host of other eager explorers, such as Murchison, Dawson, Guyot, Geikie and Marsh are still at work upon the problem of its past present and future development as an organism moulded by mechanical, chemical, and vital laws.

Meanwhile, however, in the next stage of avoidance, a mere speculative geology was steadily ignoring that true biblical geology which had not yet been affected. In place of the doctrines of the creative Spirit, the six days' work and the new earth, arose various hypotheses as to the formation, the periods, and the destiny of the globe. As to its formation, there were the two rival schools of Neptunists and Vulcanists. According to the Neptunists, the crust of the earth was formed through the agency of water. It had been taught in the Church, from the time of Augustine and Tertullian, that this element prevailed at the creation as well as at the deluge. Colonna, Steno and Scilla, having accepted the traditionary cosmogony, could only regard fossils and strata as mere drift and sediment of a great inundation which had issued, it was generally believed, from subterranean fountains, formed when the sea was divided from the land and drained into a central abyss. Woodward, also, on the same theory, published a Natural History of the Earth, in which he conceived the whole terrestrial globe to have been dissolved at the flood, and the strata to have settled down as mere earthy sediment, together with the fossils, the heavier shells in stone, the lighter in chalk, according to the order of gravity. Vallisnieri, however, without referring to the miraculous event of the deluge, and insisting only upon natural causes of geological change, inferred from the continuous layers of rocks throughout Italy, that they must have been deposited by the gradual subsidence of a universal ocean. Werner, the founder of the great school of mines at Freyburg, carried Neptunism to an extreme by his theory, that the primitive earth had been enveloped in a chaotic fluid, precipitating successively over the whole globe the three formations of granite, slate and

clay, which he found in the little province of Saxony, and which he even fancied must have predetermined the course of civilization, according as one or the other became prominent in different regions, along the banks of the Nile, on the steppes of Tartary and amid the mountains of Switzerland. Cuvier, in his "Theory of the Earth," endeavored to explain the deposition of the strata by imagining a series of cataclysms or irruptions of the sea upon the land, produced by unknown causes, and leaving behind them successive beds of fossils as the remains of former animal kingdoms. Dr. Daubeny ascribed even the phenomena of volcanic eruptions and earthquakes to the action of water rushing underground from neighboring seas, and chemically combining with metallic masses in the caverns of the earth. Professor Agassiz, reasoning from the same element in its frozen form, as investigated by Charpentier and Guyot, has offered the ingenious conjecture, in his "Studies of Glaciers," that whole continents were once covered with sheets of ice; not the motionless torrents which Coleridge fancied he beheld in the Alps, but vast avalanches, scouring through deep gorges over distant plains, and strewing enormous boulders in their course. And extravagant as such opinions may appear, they have left a residuum of truth in abundant evidences of former revolutions effected by water, at least in the superficial strata, such as glacial drift, marine remains, alluvial soils, and, indeed, the whole mass of fossiliferous rocks, which are generally conceded to be largely composed of aqueous formations.

According to the Vulcanists, the crust of the earth was formed by the agency of fire. It had been held by some of the Greek philosophers that the world originated in that element, and the younger Pliny had referred to earthquakes and volcanoes as evidences of vast igneous forces imprisoned, like smothered embers or cavernous furnaces, in the earth. Robert Hooke, recurring to these ancient opinions in a Discourse on Earthquakes, explained by them the catastrophe of Sodom and Gomorrah, and even the Deluge itself, which he attributed to subterranean action, forming mountains into plains and plains into mountains, land into seas and seas into land, and thus exposing shells and bones upon the highest Alps

and Apennines, where, with much astonishment, we find them. James Ray followed Hooke with an essay on "Chaos and Creation," in which he ascribed to similar agencies, operating as second causes in the crust of the earth, the original emergence of the dry land and subsidence of the sea, described in Genesis. Leibnitz, however, without reconciling such speculations with the Mosaic cosmogony, declining, indeed, to press them to their consequences, published in the beginning of the eighteenth century a treatise styled "Protogea," or the Primitive Earth, in which he described our planet as an extinguished sun, having been originally an igneous globe, which had cooled and condensed through successive stages of vapor, water, and rock into its present stratified form. The great French naturalist, Buffon, incurred the censure of the Sorbonne for a similar "Theory of the Earth," according to which our world was represented as a blazing fragment of the sun, struck off by a comet, and left to whirl and cool for ages, forming its present valleys and mountains by combined aqueous and volcanic action. James Hutton, the celebrated Scotch geologist, usually called the founder of the Vulcanic or Plutonian school, in his "Theory of the Earth," characterized the globe as a rocky shell, periodically rent and fused by internal fire operating through indefinite ages. Sir Charles Lyell, in his "Manual of Geology," has employed the principles of Hutton to explain and classify certain rocks, lava, granite and slate as volcanic, plutonic and metamorphic, according as they have been erupted upon the outside of the earth, or fused and compacted within the earth, or transformed out of old aqueous deposits into new igneous compounds, the latter class including even former portions of the fossiliferous strata. Dr. Mantell also, in his "Wonders of Geology," has grouped together such volcanic ejections, granite peaks and abysmal fissures, with hot springs, new islands, water-spouts and other marine phenomena, as but connected expressions of the same terrestrial force, due alike to the reaction of the interior heat of the globe upon its exterior surface. Saussure, Daniell, Marcet, De la Rive and Reich and other thermometricians, after careful measurements in mines, springs and artesian wells, announced the general conclusion that the temperature of the

earth increases as we descend, at the rate of about one degree for every fifty feet; so rapidly, indeed, that at the centre the hardest rocks and metals would be melted in an instant. At length Humboldt, in his "Cosmos," combining these various geological data with the astronomical speculations of La Place and Herschel, has described our planet as one of the nebular rings of the primitive solar system, which has agglomerated into an incandescent sphere, and then hardened into a granite shell, to serve as the primordial base of the whole subsequent edifice of mineral and organic systems which have successively flourished and decayed upon its surface. And daring as such hypotheses may seem, they rest not only upon numerous signs of the present agency of fire in the terrestrial economy, but upon the admitted fact that the great solid masses of the planet are igneous formations.

As to the development or periods of the globe, there were also two parties,—the catastrophists and the uniformitarians. According to the catastrophists, ancient processes in the earth were rapid and violent. It had long been the faith of the Church that the world was fashioned out of chaos in six days, and afterwards totally destroyed by the Deluge in a few weeks. And some of the early geologists, proceeding upon this dogma as a scientific hypothesis, could only ascribe to aqueous and igneous causes in former times an operation almost miraculous, if not monstrous. Woodward, as we have seen, reasoning as a neptunist, had actually represented the entire crust of the globe as having been dissolved and stratified, with all its serried fossils, in the space of a few months. Hooke also, reasoning as a vulcanist, had not only endeavored to explain the phenomena of the Deluge by means of earthquakes, but also the extinction of fossil flora and fauna in the areas which these had convulsed; and even the general configuration of the globe, including a sudden upheaval of the Alps and Andes, in a few months, since which great crisis of nature their action had become languid and quiescent. Ray, Whiston, and Burnet, with other Scripture geologists, endeavored to explain the disordered strata and irregular climate of the globe by a supposed distortion of the paradisaic earth from an upright to its present oblique axis, or by the sun's rays fissuring its crust

and flooding it with the central waters in time of the Deluge, or by the successive shocks of comets, and other such planetary convulsions. Cuvier, besides ascribing the aqueous rocks to successive deluges, characterized those events as sudden and terrible catastrophes, which at ancient epochs had desolated the entire surface of the globe, and for which no adequate cause can now be found, either in the earth itself or in its astronomical changes, which were too gradual to have buried tropical animals at the poles. Sir Humphry Davy also, in avowed opposition to the doctrine that the present is the ancient and constant order of nature, maintained that the fossiliferous strata themselves indicate a succession of destructions and creations, preparatory to the appearance of man. The distinguished geologist, Élie de Beaumont, attributed the igneous rocks, expressed in parallel mountain chains, to successive earthquakes or frightful convulsions, which after long periods of comparative repose had instantaneously burst through the sedimentary strata with protruding masses from beneath, and had probably been caused by the cooling of the heated contents of the planet, rather than by any ordinary volcanic action. Humboldt, after describing both the aqueous and igneous rocks which are now visibly forming, such as alluvium and lava, remarks that they are but a faint reflection of that more energetic activity which must have characterized the early globe, when its molten nucleus and vaporous atmosphere were in constant communication through the vast fissures which had not yet been closed by irrupted mountain ridges, nor relapsed into abysmal seas. And distant and unfamiliar as such a world must now appear, it cannot be denied that the fossils of monster plants and animals, the broken strata and distorted surface of the globe, viewed with the occasional freshet and the smouldering volcano, are very suggestive of spent forces which may once have operated with paroxysmal violence.

According to the uniformitarians, however, ancient processes in the earth were even and tranquil. It had been the teaching of Greek sages that the world from eternity, or from an indefinite antiquity, had been transformed by fire and water; and Strabo, the great geographer, had referred the

moulding of existing continents and seas to volcanoes and inundations, as still obvious causes which were of daily occurrence. But the dogma of a recent creation of strata had become so sacred to the Western mind, that it was only after centuries that any other view would be entertained even as a scientific hypothesis. Vallisneri, among the first, rejected the brief deluge of Noah as too miraculous a mode of stratification; substituting for it the sedimentary action of ordinary seas, which had slowly retired after prevailing for a long time. Lazaro Moro, rejecting the catastrophic miracles of Burnet and Whiston, endeavored to explain the original formation of continents through volcanic action; as illustrated in a new island-mountain which had recently emerged in the Mediterranean, covered with shells, fossils, lava, and gradually with vegetation. And his enthusiastic expositor, Generelli, not only argued that such phenomena may be proceeding imperceptibly on a large scale over the earth during a lapse of ages, but also insisted that they belonged to a system of waste and repair, by which the equilibrium of land and sea has been maintained from the beginning. Buffon, having described the aqueous and igneous forces which originally heaved the mountains and drained the valleys, maintained that the same causes were still active, and would gradually submerge existing continents under the ocean, and reproduce others like those we now inhabit. Raspe, known more generally as the editor of "Baron Münchausen's Travels," published a work on the "New Islands Born of the Sea," in which he not only ascribed the production of continents to existing causes, but suggested their indefinite duration, the secular changes of climate and species, and other problems of modern geology. Professor James Hutton, the founder of the uniformitarian school, boldly declaring that in the economy of the world he could find no traces of a beginning and no prospect of an end, enunciated the principle of a gradual decay and metamorphosis of rocks, which he described as the ruins of former worlds successively disintegrated and reproduced by known chemical agencies still observable in the deposit of alluvium and the formation of lava. Geoffrey St. Hilaire, Lamarck, and other naturalists, as we shall see, broached the

cognate principle of a gradual extinction and generation of animal species by transmutation of one into another, rather than by successive catastrophes from which none could escape. Babbage, in view of the co-action of climatic and organic forces, referred the tropical flora and fauna of the primitive earth to the excessive radiation of its internal heat, which in former epochs had converted it into a vast hot-house, but with the lapse of ages had been checked by the continued formation of a non-conducting crust of interior lava and exterior sediment. Sir John Herschel was so persuaded that geological revolutions are regular and not convulsive, that he sought to explain the difference between ancient and modern climates, which geology clearly indicates, by astronomical causes acting imperceptibly through myriads of centuries, such as the gradual alteration of the earth's orbit and exposure, and even a possible fluctuation of heat and light in the sun itself, after the manner of the variable stars. At length Sir Charles Lyell, in his masterly work on the "Principles of Geology," bringing together all these varied phenomena under one wide induction, has referred them to existing terrestrial causes, both internal and external, which, by slowly shifting the continents from one part of the globe to another, have successively produced and fossilized the various floras and faunas that have flourished and decayed over the earth through indefinite time. And if it be held that such apparent catastrophes as floods and earthquakes are but incidental, like the occasional fall of a ruined tower, or even normal, (what Raspe termed Nature in the act of parturition), we shall certainly find much in the regular succession of the ancient strata and fossils, viewed in connection with existing climates and species and the known rate of their action, which might suggest a steady play of forces ever operating with uniform tranquillity.

As to the destiny of the globe, there have also been two corresponding opinions. Many of the early geologists predicted the dissolution of the earth. It had, in fact, long been a sacred tradition, both pagan and Christian, that the world was to be consumed by fire, as it had once been submerged with water. Plato, in his Phædon, had discoursed sagely concerning the Pyrophlegethon, or infernal lake of fire which

was supposed to girdle the earth and at times overflow it with lava streams from Ætna and Vesuvius; and Pliny had been so impressed by its combustible materials, that he had declared it the greatest of miracles that a day could pass without a general conflagration. Hooke and Ray, with the English geologists of their time, reasoning from the prophecies as postulates, and from the examples of Sodom and Gomorrah, speculated upon the destructive agency of earthquakes and volcanoes in bringing about a universal catastrophe, of which the buried ruins of Herculaneum and Pompeii and the prostrate cities of Spain and Chili were but the premonitions, and which might finally inflame the heavens as well as the earth. Leibnitz, as a mere scientific cosmogonist, retained from his primitive globe of fire a volcanic nucleus, ever and anon agitating its rocky shell with subterranean tremors and bursting forth in floods of lava. John Mitchell published, in 1760, an essay on the "Causes of Earthquakes," in which he seems to have revived the picturesque theory of Ovid concerning the inflated cone of Methone, by referring the wave-like motion of the ground to imprisoned air forcing itself along, as in the folds of a carpet, between the solid strata and the fluid lava upon which large districts were supposed to float. And more recently, Professor Rogers of Philadelphia has attributed such terrific land-tides to actual pulsations of the molten matter itself, under enormous tension, exploding in volcanic gases or escaping into the cavernous spaces beneath. Cordier, Fourier and Humboldt, on the basis of their thermometrical researches, described our planet as a liquid ball of glowing metals and lava, steadily cooling and shrinking within a solid crust relatively no thicker than an egg-shell. Sir Humphry Davy, in a memoir on volcanoes, threw out a suggestion, based upon his chemical discoveries, that the rapid combustion of the primitive globe formed an oxidized crust, within which remained compacted various inflammable metals, needing only contact with the hydrogen afforded by neighboring springs, in order to fuse the surrounding rocks into such a substance as lava; and Dr. Daubeny, pursuing this conjecture, has argued from the weight of the globe and the prevalence of volcanoes in its maritime regions, that its vast metallic

contents are but like smothered fuel, ever kindling afresh and exploding in jets of mud and fire. Other and still bolder theorists, leaving the earth, have fancied atmospheric and astronomic agents of combustion, such as the electric storm, the meteoric shower, increasing solar heat and even stellar radiation throughout the celestial spaces, exceeding in some regions the glare of a tropical sun. And if both classes of igneous influences be combined in our fancy—those which gleam around the planet in the blazing comet and the hurtling thunderbolt, with those which burst from within it, flaming in its thousands of volcanoes and shaking its populous cities into ruins—we shall be at no loss for instruments as well as presages of a general disaster.

Most later geologists, however, have maintained the stability of the earth. The repeated failures following attempts to fix the date of its predicted dissolution at length converted a religious foreboding into scientific skepticism, at first expressed in vagaries wilder than the fabled descent into Avernus. In place of the central fires and combustible contents of the globe, was imagined a hollow sphere, distended by expansive forces, lighted by the two subterranean planets, Pluto and Proserpine, and even peopled with imaginary plants and animals. The celebrated Halley published a paper in the Philosophical Transactions on the "Structure of the Internal Parts of the Earth and the concave habited Arch of the Shell," in which he gravely explained the phenomena of terrestrial magnetism by a huge metallic nucleus rotating in the interior of the globe. Holberg, a Norwegian dramatist, embodied a quaint satire upon the inhabitants of the upper earth in a scientific romance respecting the physical scenery, people, and institutions which had been discovered on a journey into the nether world. The more notorious Captain Symmes repeatedly invited Sir Humphry Davy and Baron Humboldt to undertake a subterranean expedition to the interior regions through a cavernous opening, which he maintained would be found near the North Pole.

And such pleasantries, in the progress of science, were seconded by more exact hypotheses as to the decline or absence of infernal fires. Buffon, indeed, in advance of

modern researches, consistently with his view of the earth as a dying ember of the sun, had already anticipated, from its gradual refrigeration, a reign of perpetual winter rather than its dissolution in flames. And recent physicists, according to Professor Winchell, have conjectured that the diurnal rotation due to primordial heat will gradually be overcome by the lunar tides, the day waning more slowly as the cooling earth spins more feebly, until at length, like the moon, it shall flutter upon its axis as a dead world, with the same pallid face ever turned to the sun. Fourier, though he conceived the central mass to be twelve times hotter than molten iron, had so little fear of any igneous catastrophe, that he computed its radiation at the slow rate of about a three-thousandth part of a second in a century, only sufficient to melt a layer of ice ten feet thick in that time. M. Pouillet ingeniously estimated that the quantity of heat derived annually from the central earth is not one-fortieth of that received from the sun, which alone would melt a stratum of ice around the globe nearly fifty feet thick in a single year. Mrs. Somerville has remarked that the conditions of vegetable and animal life are so entirely due to the solar rays that it is of very little consequence whether the centre of the globe be liquid fire or ice, the interior heat not being sufficient to melt the snow at the poles. Sir William Thomson and Mr. Hopkins have at length wholly discarded the notion of any existing interior fire; maintaining that if the globe was originally in a melted state it must have cooled and hardened from the centre, and that its rigidity and general solidity can be mathematically proved from the observed rate of solar and lunar attraction. It is indeed held by some eminent geologists that La Place long ago afforded a full refutation of the theory of central fluidity by demonstrating that since the time of Hipparchus, in two thousand years, the mean day has not shortened by the three-hundredth part of a second, as would have been the case, had the earth been a cooling and shrinking globe, rotating with increasing velocity. And to these considerations have been added others in favor of a sort of thermal equilibrium of the planet, in both its internal and external relations. Sir John Herschel and Mr. Babbage, on the

hypothesis of an interior stratum of lava, ascribed earthquakes and volcanoes to the unequal pressure of the crust upon the fluid mass, and regarded them as vents and safety-valves, serving to equalize the interior temperature of the earth and maintain the general tranquillity of its surface. Sir Charles Lyell not only contended that the supposed fiery nucleus of the earth could not exist a moment without melting its crust in the effort for uniform temperature, but also argued that volcanoes and earthquakes are really conservative rather than destructive agencies, proceeding from internal chemical action, and tending to preserve the balance of land over the globe, and thus sustain the successive climates and species which follow its shifting continents. The younger Herschel, besides referring terrestrial climate to celestial causes alone, held its secular changes to be periodic and salutary rather than cumulative and disastrous; ranging between excessive summer and winter, through unknown epochs, according as the decreasing or increasing eccentricity of the earth's orbit yields a greater or less amount of solar heat. Adhémar, Croll and Drayson, combining such astronomical data with the evidences of ancient tropical vegetation at the poles, have calculated that our planet, as it sways and nods toward the sun, has its northern and southern hemispheres alternately crowned with verdure or capped with snow, about every other twelve thousand years. And if to these periodic fluctuations of temperature within the solar system be added those which may prevail beyond it in the stellar regions, as suggested by the elder Herschel and Poisson, we can imagine the earth, while it follows the sun among the stars on his journey of eighteen million years, undergoing climatic revolutions quite adequate to clothe it either with ice or with fire; passing indeed through a sort of sidereal winter and summer, amid which our whole historic epoch, with all its swelling annals and teeming arts and splendid works, shall seem transient as the hues of morn or the flowers of spring.

The whole problem of the origin, development and destiny of our planet is thus seen to be but part of the vaster problem of the celestial cosmogony, and at length brings us to the point at which the empirical geology may call for some

logical connection with the revealed genesis. Were it fully solved, the cause and purpose of the long wonderful evolution of strata, flora and fauna, would still remain before us in the outlying field of metaphysical inquiry. As yet, however, there is no sufficient agreement among scientists even as to the terms of the problem, much less any accepted solution of the problem itself. It is still in that hypothetical stage of research where empirical science may appear independent of revealed religion.

Entering the revealed section of the same science we shall find corresponding departures from the rational theory of the earth. The first stage was that of expelling the false scientific geology which had been foisted into the Scriptures. It was a time to vindicate them from erroneous hypotheses, which claimed its authority, and a few divines were found bold enough to lead the way to a more scientific interpretation. As early as the ninth century, St. Virgilius asserted the true figure of the earth against the rectangular geography of the fathers. In spite of the charge of diabolical magic, great scholastic divines, like Roger Bacon, Albert of Bollstadt, and St. Vincent of Beauvais, became the pioneers in physical geography, natural history, and other geological sciences, which are now associated only with secular names. Cardinal Alliacus, early in the fifteenth century, published a geographical "Picture of the World," which was the text-book of Columbus in his studies and voyages, and is cited by Humboldt as the chief authority of the time. Cardinal Querini in the next century, speculating upon the fossil shells of inland regions, at a time when all the theologians of Europe were persuaded of their diluvian origin, endeavored to refer them to purely natural causes, and ventured for the first time to question the universal prevalence of the flood. Dr. John Keil, the vindicator of Newton at Edinburgh and Oxford, published an Examination of the Scripture cosmogonies of Burnet, Warren, and Whiston, assailing with caustic wit their pedantic treatment of the deluge, which he insisted should be regarded only as a moral event or supernatural judgment, and not as an ordinary freshet drowning a few country people. The learned Carmelitan friar, Cirillo Gennarelli, before the academy of Cremona, elo-

quently denounced the same school of divines, as capriciously calling the Deity upon the stage to confirm their preconceived hypotheses, and building systems in the air which cannot be propped up without a miracle. Bishop Herbert Croft, in his "Animadversions" upon Burnet's theory, repudiated it as a mere ingenious romance, tending to the discredit of the Scriptures as well as of true science; whilst the Puritan naturalist, Ray, stigmatized the Woodwardian hypothesis as an attempt to adjust scientific phenomena to theological prejudice. Bishop Stillingfleet, whose Origines Sacræ appeared in the midst of the controversy, saw no urgent necessity from the Scripture to assert the universality of the deluge as to the globe of the earth, unless it could be proved that the whole earth was peopled before the flood. Matthew Poole, also, the great non-conformist divine, in his "Synopsis of Critical Writers" on Genesis, argued that to confine the deluge to the habitable world, besides being all that its moral design required, would effectually silence those irreligious persons who cavil at the truth of the sacred narrative. Bishop Clayton of Killala, in his learned "Vindication of the Old Testament History," broached, on physical as well as scriptural grounds, that theory of a partial deluge now so generally received, but then opposed as a deadly heresy. The Rev. John Michell, from the very chair of Woodward, began to issue geological essays, in which the pious speculations of his predecessor were avoided with scientific rigor. Bishop Berkeley, among other sagacious remarks in his "Alciphron," inferred the comparatively recent origin of man from the lack of civil or historic remains among the shells and stones buried underground many thousand years ago, and argued a beginning of the world from such natural causes as the decrease of fluids, the sinking of hills, and the diminution of planetary motions. At length Dr. Chalmers, as if to close the long fruitless defence of an untenable position, declared from a chair of St. Andrew's, in the city of Hutton, that the Mosaic writings do not fix the antiquity of the globe. And from this time repeated attempts have been made by such scientific divines as Pye Smith, Fleming, and Hitchcock, to reconstruct the whole scripture doctrine of the earth as the appointed abode of man.

Meanwhile, in the next stage of separation various dogmas still remained not yet adjusted to the new scientific geology. Whilst the votaries of that science were investigating the physical formation, development and destiny of the globe, theologians adhered to traditional teachings concerning the primitive chaos, the six days' work, and the predicted new earth. As to the primitive chaos out of which the earth was formed by the Divine Spirit, religious writers had long been agreed. The idea of an original mass or void was so prominent in all ancient cosmogonies, both pagan and Christian, as to have suggested a common revelation for its source. The Hindoos had been taught in the Songs of the Vedas and the Institutes of Menu, that the first sole Cause, with a thought created the waters and then moved upon them in the form of Brahma, the creative agent, until the shapeless ocean was distributed into land and sea and sky. The Egyptians believed, as Orpheus sang to the Greeks, according to Aristophanes, that the sable-plumaged Night having been embraced by Love, resplendent with golden pinions, conceived the world as a chaotic egg, and by brooding upon it developed it in its organized form. The Persian fire-worshippers, as reformed by Zoroaster and represented by Manichæus, held that from the Eternal Being, through his creative Word Honofer, had proceeded the two principles of light and darkness, good and evil, termed Ormuzd and Ahriman, by whose antagonistic efforts the contrasts of the universe were produced. Many of the philosophizing Jews and Christian gnostics maintained a similar dualism of God and the world, spirit and matter, the former fashioning the latter from a crude into an organized state, in spite of Satanic opposition. Some of the early Church fathers, such as Chrysostom, Basil and Ambrose, in their homilies upon Genesis, taught with more or less distinctness that the earth was first created a rude and shapeless mass, without form or ornament, and that it was only after an unknown period of darkness that light was made and the six days' work proceeded. The schoolmen distinctly held the doctrine of an original chaos, carefully distinguishing between a primary immediate creation of matter in the beginning, by which the simple substances or elements originated, and a

secondary mediate creation of forms, during the six days, by which the elements were disposed and combined as organized products. Thus the Venerable Bede, in a work on the Hexæmeron, taught that before any day God made the angelic nature and formless matter, the six days then following, as narrated in Genesis. Hugh of St. Victor held that light was created not out of nothing, but out of pre-existing shapeless matter, in order to prefigure to rational beings the transformation from moral deformity into beauty, and that the separation of light and darkness involved a corresponding separation of good and evil angels. At length Peter Lombard, in his Sentences, expressed it as the orthodox teaching that in the beginning God created the heavens (that is, the angels) and the earth (that is, the confused, shapeless material of the four elements, called chaos by the Greeks) and that thereafter the elements were distinguished and assigned to different objects, according to their species. Protestant divines also, such as Calvin, Peter Martyr, Hollazius and Quenstedt, maintained that, while the angels, the soul of Adam and the elements were created of nothing, all other organized beings were gradually produced from a rude and indigested mass or chaos, upon which the creative Spirit moved or brooded with vivifying and organizing power. Some mystical divines went so far as to admit the agency of the devil in thwarting or marring the creative process, which they represented as itself a degradation from the infinite into the finite, while chaos was a still farther degeneration, resulting from the fall of the angels. As yet, however, few if any attempts could be made to connect these various dogmas with physical researches into the supposed nebular origin of the globe; and the aqueous and igneous phenomena, since claimed by the Neptunists and Plutonists, such as inundations and volcanoes, were simply viewed as special divine judgments, or referred to the primal curse upon the earth for man's sake.

As to the hexæmeron or six creative days, various opinions had been handed down from the primitive revelation. The eastern cosmogonies had generally proceeded upon the conception of a creation accomplished in successive periods. Brahma, the creative deity of the Hindoos, had been repre-

sented as alternately vivifying and destroying the world by waking and sleeping at the dawn and night of each long day of his existence, through many thousand kalpas or ages. Zoroaster had taught the Persians that God created the world not in six natural days, but in six times of different length, together amounting to three hundred and sixty-five days or full years, with a succession of works substantially similar to those described by Moses. The Etrurians also held the same order of creation, but allotted six thousand years to the process, each thousand years constituting a day. According to the Jewish Cabala, the world was created in six days, which respectively prefigure the six thousand years of its history, the seventh millennium to follow as a great Sabbath or era of universal peace. Philo the Jew, in his Sacred Allegories, declared that only rustic simplicity could imagine the world to have been created in six days, or in any definite time, when the perfect number seven, the Sabbatical period, was all that was intended by the septenary division of the week of the creation. And the majority of the Christian fathers, with some of the schoolmen, regarded the creative days as mere timeless acts or works of God, figuratively represented as successive mornings and evenings. Origen, in his Reply to Celsus, utterly repudiated the external sense of Scripture as to the six days consumed in creation, and maintained that the world was produced in a single moment; exclaiming, What sane mind can think that the first, second and third day, with morning and evening, could have occurred without sun, moon and stars! Athanasius, too, in his "Sermons against the Arians," asserted that no one thing was made before another, but all things were produced together by one and the same mandate. Augustine, unequivocally adopted the sentiment of Ecclesiasticus, "He that liveth forever created all things at once," and argued from the text of Genesis that the first three days could not have been measured by the rising and setting of the sun, before the appearance of that luminary, and that the six creative acts were not successive in fact, but only in our thought, and so represented merely in accommodation to our earthly conception of work-days, which begin and end with morning and evening. And the same general view was

accepted by Aquinas and Albert. Other scholastics and most Protestant divines, however, were inclined to the literal sense of days of twenty-four hours. Hugh of St. Victor, combining the literal with an allegorical interpretation, held that the Almighty might have created the world differently, even in a moment of time, but chose to form it out of chaos in six days, in order to convey moral instruction to His intelligent creatures in successive lessons. Peter Lombard, digesting the Church authorities on the question, in his Book of Sentences, inferred that God formed the elements into distinct orders of beings not at once, as some of the holy fathers taught, but as it appeared to others, through intervals of time, even six diurnal revolutions. Calvin also repudiated the traditionary teaching, that the world was created in a moment, and argued that six days were employed in its formation, not that God had need of this succession, but that He might engage us in the consideration of His works, and render them perspicuous and intelligible as matter of devout contemplation. Turrettin defended the same opinion as required by the obvious sense of Genesis, especially the reason annexed to the fourth commandment, "For in six days the Lord made heaven and earth and all that in them is"; though he also argued that the whole work of each day was produced by an instantaneous fiat, plants and animals in a mature state, and, therefore, in the autumn of the year, and not in the season of spring, as some of the fathers had fancied. Archbishop Usher, whose "Annals" afforded the chronology of our English Bible, fixed the date of the creation of the world on the 25th of October, 4004 B. C.; and the painstaking Baptist commentator, Dr. Gill, counted the successive days of the creative week from that epoch as carefully as if he were calculating an almanac. Geologists, it will be remembered, had not begun to claim for the successive strata, floras and faunas, those indefinite intervals of duration which would have suggested that the six days before the Sabbath may have been but confused formative eras, followed by the present human epoch of order and tranquillity.

As to the future new earth, predictions had appeared in nearly all the sacred writings of antiquity. From the earliest

time, in all nations, occasional destructions and renovations of the earth had been associated with a degeneracy and regeneration of mankind, as divine judgments and blessings, and had been referred to the alternate agency of water and fire the two most powerful and familiar causes of disaster. Plato tells us, in the Timæus, that the Egyptians believed that deluges and conflagrations were employed by the gods to arrest the extreme debasement of mortals and renew the earth for another golden age. In the Sibylline books, this predicted golden age of the earth is depicted, according to Virgil, almost in the language of Isaiah, as a time when the kid shall no longer fear the lion, the serpent and noxious herb be destroyed, and clusters of grapes hang upon the bramble. The Stoics, in describing the same scene, employed the very epithets of St. Peter and St. Paul, such as restitution, palingenesia and resurrection, and referred to the purifying agency of fire, as inculcated in the Orphic Hymns. The Arabians had their fable of the Phœnix, according to which the earth, after having been burned up, would rise out of the ashes with renewed vigor and beauty. The doctrine of a renovation of the earth by a general conflagration, was also common among the Jews in our Saviour's time, and as enunciated by the apostles was adopted by the fathers, and at length matured by the schoolmen into the dogmas of purgatory and the final judgment, with a blending of pagan and Christian traditions; as may be found expressed in the first verse of the Dies Iræ, anticipating the dissolution of the world in flames on the authority of both David and the Sibyl. Protestant theologians also, with the exception of those who interpreted the prophecies figuratively, looked forward through the fires of the last day to a resurgent earth, adorned and purified as the abode of the righteous, the realm of Messiah, and mayhap the scene of heaven itself. But as yet such opinions were based upon the Scriptures exclusively, as part of a dogmatic system, without any physical reference to the central fires of the earth or its supposed catastrophic or climatic revolutions in the astronomical heavens. And they are still so held and enjoined by the chief religious authorities, amid many crude attempts to harmonize them with the new geogonic speculations.

Geology, as now surveyed, presents to us, not only many discovered facts and revealed truths respecting the order and beauty of our terrestrial system, but also a mass of hypotheses and dogmas as to its origin, development and destiny. These hypotheses and dogmas are in more or less seeming conflict; but neither as yet has driven the other from the field, and it remains to be seen which will predominate, or whether in the progress of research they may not so modify each other as at length to appear essentially consistent and harmonious. Such a result is rendered probable by the fact that devout naturalists and learned exegetes, not deterred by former mishaps and failures, are still endeavoring to trace a more exact parallelism between the six creative days of Genesis and the great cosmogonic epochs of geology.

SECTION III.

Anthropology, Rational and Revealed.

In the rational section of anthropology we find the same gradual divergence from the revealed doctrine of mankind. In the first and legitimate stage of separation came the decline of the false biblical anthropology of the schools. It was the time when the scholastic definitions of man were being tested by the demonstrations of the scalpel, and great naturalists were loyally tracing the steps to his throne in the kingdom of nature. Early in the fourteenth century, Mondino of Bologna, the father of modern anatomy, whose treatise on the internal organs became the text-book in the schools of Italy for two centuries, had restored and improved the system of Galen by means of human dissections, at a time when they were forbidden as sacrilege with Moslem rigor. Leonardo da Vinci, the universal genius of the fifteenth century, scarcely less accomplished in science than in art, for the mere uses of painting and sculpture, had delineated the exterior muscles, with an intuitive accuracy which Hunter pronounced unsurpassed in that age, and Sir Charles Bell has since but confirmed as the true anatomy of expression. Berengar of Carpi, advancing beyond Galen and Mondino, had demonstrated the system

of the internal tissues, by dissecting and comparing apes and men, with a boldness which at length led to his banishment. Achillini, Eustachius, and Fallopius, by the discoveries still associated with their names, had illustrated the same golden age of Italian Medicine, whilst the rest of Christendom were stigmatizing such researches as mere profane temerity. Andrew Vesalius of Brussels, usually styled the founder of human anatomy, who for its sake braved the terrors of the plague, the gibbet, the charnel house, exile, shipwreck, and a forgotten grave, at length appeared, to complete the labors of his predecessors in his great work on the Structure of the Human Body, exhibiting for the first time a full view of all its organs and textures, with the aid of the magic pencil of Titian. Servetus, Levasseur, and Cæsalpin threw out conjectures which it is the glory of Harvey to have confirmed, by demonstrating the circulation of the blood

And at the same time, in other connected fields of living nature, Gesner of Germany, Aldrovandus of Italy, and Ray of England, building their ponderous tomes, one above another, upon the natural history of Pliny, slowly erected the countless genera and species of plants, insects, birds, and beasts, in lucid order, toward the genus Man, at the summit of the animal scale. Linnæus, the great Swedish naturalist, soon placed him upon that pedestal, in his "System of Nature," by proposing him as a legitimate subject of comparative zoölogy, to be classed anatomically next above the apes, in the sovereign order of primates, as the head of the mammalia. Buffon, Blumenbach, and Cuvier followed in the steps of Linnæus, and led the way for Lawrence, Morton, Agassiz, by still further distinguishing him as chief of the vertebrates, erect, two-handed, with large frontal brain, speech and reason; and distributed his species according to climate and color, into varieties such as the white, yellow and black races of Europe, Asia and Africa.

In the next ascending science, Adelung, fulfilling the prophetic genius of Gesner and Leibnitz, the forerunners of comparative philology, afforded the first means of studying affinities of speech as well as of race, by publishing the "Mithridates," or general science of languages, containing the

Lord's Prayer, in five hundred dialects, systematically arranged. Vater carried forward the unfinished work of Adelung. Prichard, with prodigious research and learning, combined the study of languages with that of nations, in his Natural History of Mankind. Frederick Schlegel, in his Essay on the Language of the Hindoos, sketched with philosophical genius that historical connection of the Indian and European tongues, which Sir William Jones had already surmised. Francis Bopp, by his "Comparative Grammar" of the same dialects, demonstrated their original identity of structure. And Wilhelm Humboldt, Latham, and Bunsen, penetrating to the philosophy as well as history of all human speech, began to reduce it to classes and kindreds, such as the monosyllabic, agglutinate and amalgamate; the Hamitic, Shemitic, and Japhetic; the African, Turanian, and Aryan.

Archæology, too, on a still higher plane of research, joined the study of human races and tongues with that of ancient arts, as Champollion and Lepsius in Egypt, Layard and Robinson in Syria, Stevens and Pickering in America, Moffat and Livingstone in Africa, and Nillson in Europe collected the first materials for tracing the lost epochs and stages of primitive civilization, such as the ages of iron, of bronze, and of stone. At length archæo-geology, the science which crowns all the other anthropological studies with that of animal and human remains, has ventured still further backward through the past organic epochs of the globe in the steps of Frere, Christol, and Schmerling, among the extinct climates, floras, and faunas co-eval with pre-historic man, in the times of the glacier, the pine, the gigantic reindeer, and the lake-village. And thus the whole field has been cleared for such living anatomists as Gratiolet, Leidy, and Owen; such linguists as Max Müller and Whitney; such antiquarians as Rawlinson and Schlieman, and such palæontologists as Pictet, Cope and Marsh, to attack from all points the complex problem of man, viewed as a crowning product of the terrestrial system moulded by organic and climatic laws.

But meanwhile, in the next more marked stage of separation, had been growing up a mere speculative anthropology in place of that true biblical anthropology which still endured.

For the Scripture doctrines of the fall of man and the first and second Adam, were gradually substituted various physical hypotheses concerning the origin, the unity and the destiny of the human race. As to the first of these questions, there were two rival hypotheses. The one was that of a transmutation or development of species. It had been a conceit of the Greeks and Romans, as expressed by Horace in his Satires, that when the animals first crept forth from the newly-formed earth, a dumb and filthy herd, they fought for acorns and hiding-places with their nails and fists, then with cudgels, and finally with arms, as experience taught them; they next invented names for things and words to express their thoughts; and at length began to abstain from war, to fortify their towns, and to enact laws. But as the Christian mind of western Europe became imbued with the doctrine of the fall of man from Paradise, this classic myth of his animal origin disappeared; and it was only after a long course of rigorous speculation and by successive conquests over religious prejudice and physical antipathy, that the pleasantry of the satirist has become a grave question of science, and even such a familiar topic of literature, that Mr. Hallam does not hesitate to affirm that "the framework of the body of him who has weighed the stars and made the lightning his slave, approaches to that of a speechless brute who wanders in the forests of Sumatra." De Maillet, the French consul at Cairo, early in the last century, veiling his name under the anagram of Telliamed, and his ironical purpose in a "Dialogue between a Christian Missionary and a Heathen Sage," may be said to have led the way to this speculation, by describing the primitive animals as emerging from the slime of the deluge and becoming gradually, through successive generations, adapted in their organization to the slowly desiccated earth. James Burnet, better known as the eccentric Lord Monboddo, near the middle of the last century, in his learned work on the Origin and Progress of Languages, had entertained the wits of Edinburgh and provoked the broad sallies of Samuel Johnson, with his grim conceit of a primitive nation of monkeys, or long-tailed men, who had lost the caudal appendage as they invented speech, clothing, and the other appliances of civilization. Lamarck, one of the

greatest of the French naturalists, at the close of the century, followed with his Philosophical Zoölogy, in which, with much more knowledge and acuteness, he broached the imposing theory of a gradual transmutation of one species into another through the whole organic scale, from the mollusk up to the monkey, and from the monkey up to man, by means of their instinctive efforts to adjust themselves to new circumstances; as the turtle, forced to live on land, at length emerged a tortoise; as the cow, browsing upon high limbs, grew into the camelopard; as the wild goat, by a life of flight and terror, was changed to the gazelle; and as the ourang, driven from the trees to the ground, became erect, dexterous, articulate, ambitious, and at last civilized man. Geoffroy St. Hilaire, for thirty years afterwards, in the Academy of Sciences, stood forth as the champion of the same extraordinary hypothesis, until it was silenced by the great name of Cuvier, who cited the embalmed animals and men of ancient Egypt as witnesses that their species had not changed for thirty centuries. The author of the "Vestiges of Creation" recalled the opinion from obscurity mainly to show its defects and surmise the existence in the divine mind of some higher law of organic progression than the mere blind wants and efforts of animals themselves. And Professor Richard Owen, the great comparative anatomist, many years ago surmised the probable action of a physical law by which nature has advanced, with slow and stately steps, through the archetypal light, from the earliest vertebrate in the fish to the glorious form of man.

At length Mr. Alfred Wallace, in his work on "Natural Selection," has proposed such a law, in accordance with which it is held that nature, or the God of Nature, ever selects the best breeds among competing races, or the fittest to survive in given circumstances; the tortoise remaining long after the stranded shell; the antelope distancing the kid in the race for life, and the giraffe feeding aloft where the flocks can no longer graze. Dr. Hooker, about the same time, in an Essay on the Flora of Australia, admitted the operation of a similar law of continuous variation of species throughout the whole vegetable kingdom during indefinite periods, until the beech has supplanted the oak and the pine, and the garden rose has

bloomed out of the wild thorn. Mr. Charles Darwin, who shares the honor of the theory with Wallace and Hooker, in a simultaneous treatise on the "Origin of Species or the Preservation of Favored Races in the Struggle of Life," soon applied it to the human species in his work on the "Descent of Man," arguing from his embryonic stages and rudimental organs, that he must have originated in a hairy quadruped of the Old World, furnished with pointed ears and a long tail, and probably arboreal in its habits; and more recently has published an essay on the "Expression of Animals," designed to trace the legacies of their instinct and passion in the human physiognomy. Professor Huxley also, in his "Evidence as to Man's Place in Nature," after having shown that with respect to the hand, the foot, the brain and all other anatomical characters, man differs less from the gorilla than the gorilla from the monkey, insisted that his origin must be sought in physical causes alone, and suggested his probable derivation from a man-like ape, on the principle that the highest faculties of feeling and intellect begin to germinate in the lower forms of life, as in the dog, the cat, and the parrot. Dr. Schaafhausen of Bonn had already, in several memoirs, argued that the development of the human mind from a state of animal rudeness would be no more incredible than the growth of a chicken from the egg, and had agreed with Huxley, in citing the famous Neanderthal skull, with its low brow and small cranium, as evidence that primitive man was more ape-like and bestial than any extant tribe of savages. Professor Hæckel of Germany, with still greater boldness, in his work on the "Origin and Genealogy of the Human Race," assuming that from the womb to the grave man recapitulates all animal forms, has declared that certain rudimentary bones and muscles at the base of the vertebral column, afford incontrovertible proof of his descent from a tailed ancestor, to which he gives the zoölogical name of Pithecanthropos, or the primitive ape-man, a woolly-haired, long-headed being, of blackish color, but destitute as yet of speech, the essentially human characteristic.

Even articulate language itself, according to some late philologists of the school, is but an animal faculty of expression, which has been developed in man through enormous pe-

riods, relics and evidences of which may still be found in fossil dialects and rudimentary letters. Professor Schleicher, in treating of the Significance of Language in the Natural History of Man, has referred it to the animal stage of his development, as a capacity increasing, through successive generations, with the growth of the brain and vocal organs, except in some speechless beings, such as the anthropoid apes, who have been arrested in the process of becoming human and remained stationary. Dr. Gustav Yager, as a zoölogist, has argued that speech was discovered long before there were any men, in the pairing-call of birds and gesture-language of monkeys, who gradually added sounds and words with their growing stock of ideas, or lapsed, like deaf mutes, into a voiceless and unprogressive condition. Clemence Royer declares that all language, having originated in mere animal cries and imitative sounds, in becoming humanized has but passed, by insensible transitions, from the chatter of scolding apes to the comedies of Shakspere and Molière.

In like manner, a large body of distinguished archæologists are endeavoring to trace a genetic connection between the rude arts of this half-animal savage of the past and the whole existing civilization. Boucher de Perthes, author of a treatise on Antediluvian Man and the discoverer of the celebrated flint axes in the valley of the Somme, instead of disdaining the study of implements so simple that their human design has been doubted, declared that the first man who struck one pebble against another to give it more regular form, gave the first blow of the chisel which produced the Minerva and all the marbles of the Parthenon. Louis Figuier, though he repudiates the animal origin of the species, has published an ingenious treatise on Primitive Man, in which he depicts the first European as a Caucasian savage, advancing slowly in the stone age through the epochs of the mammoth, the reindeer and the horse, into the bronze and iron ages, among the rude arts which precede the period of modern culture, and claims a similar development for the races of Asia, Africa and America. Mr. E. T. Stevens, in an elaborate work entitled Flint Chips, a Guide to Pre-historic Archæology, has collected an immense variety of facts from different quarters

of the globe, in favor of the position that the most barbarous state is a condition not so much of degradation as of arrested or retarded progress, the starting-point of which was the manufacture of rude stone implements. Mr. Hadder M. Westropp, in his "Pre-historic Phases," has ingeniously classed the fir, the deer, and the hunter with the palæolithic or old stone epoch; the oak, the goat, and the shepherd with the neolithic or new stone epoch; and the beech, the horse, and the farmer with the bronze epoch; citing the Mexicans and Peruvians as examples of nations which have spontaneously risen through these phases, from the primitive barbarism to a high degree of civilization. Sir John Lubbock, having descended, in his "Pre-historic Times" through the different human epochs, among the sticks, bones, and horns of the most ancient stone period, finds all mankind in a savage state, out of which a few races have independently raised themselves by degrees and toilsome efforts; and in his subsequent work on the "Origin of Civilization" has collected from different parts of the world evidences of incipient culture in the most barbarous tribes, as well as of original barbarism in the most civilized nations. Sir Charles Lyell, as if to complete these various speculative researches, in his "Geological Evidences of the Antiquity of Man," has abandoned the middle ground of his earlier works and arrayed all existing anthropological knowledge in favor of a gradual transmutation of species, languages and arts throughout the whole organic series, from the earliest mammalia of the pliocene period up to the civilized man of our epoch. And assuredly, whatever may be thought of such a genealogy, or of the likelihood of tracing it, we must at least grant that it would be possible now to construct a scale of co-existing animal, savage and civilized races, ascending from the image of an ape toward the image of a God.

The other hypothesis, however, is that of the constancy of species. It had been held in the Church from the time of Augustine that plants, animals and man were instantaneously created full grown and perfect, several thousand years ago, and have ever since continued the same, each after its kind; and the early naturalists, proceeding upon this dogma as an hypothesis, not only distinguished man as a rational and reli-

gious animal, but maintained the absolute invariability of his species, even in its anatomical characters, through all ages, climates and conditions. Linnæus was careful to insist that every genus as well as species is a primordial creation; and classed the American, European, Asiatic and African races as mere varieties of the one human genus of bimana, or two-handed animals. Cuvier, so far from admitting a genealogical connection between extinct and living species, held that the palæontological series had been repeatedly broken by huge cataclysms or sudden deluges, which swept all existing animal life from the face of the globe, thus precluding the possibility of gradual transmutation. Count Lacepède, one of the professors of the Museum who reported upon the scientific spoils of the Egyptian campaign, agreed with Cuvier in inferring the immutability of species from the identity between mummied and living specimens of the cat, the dog and the bull; and when Lamarck, another member of the commission, urged that the climate of Egypt had also remained unchanged, replied that the same species might now be found in all other climates, both torrid and frigid, from Canada to Guiana, continuing to-day as they were three thousand years ago, when borne in the sacred processions on the banks of the Nile. The French naturalists also argued that domesticated animals, so far from changing their species, retain the anatomical structure belonging to them in a wild state, under all mere physiognomic differences, and only vary in the direction of original predispositions, the different races of the cat, the dog and the swine having descended from the tiger, the wolf and the wild boar; whilst the more highly-educated animals, such as the elephant and the parrot, soon reach the limits of their improvability and remain stationary for generations. It was likewise shown that hybrid varieties or mixed breeds of plants, animals and men are largely due to artificial contrivance, rather than anything like natural selection, and soon die out through infertility of their offspring, thus disclosing an actual barrier to the supposed indefinite transmutation. Indeed, the weight of scientific authority against that opinion became so strong that, until its revival and modification by Darwin, it was discussed as a mere curious speculation or tentative hypothesis, rather

than with the positive tone of assured knowledge. The Swiss naturalist, Necker, declared that nothing less than the shock of a comet or some similar disaster, could put an end to a species so long as the planet lasted. Pictet, the eminent palæontologist, reasoning from the present backward to the former course of nature, from the known stability of Egyptian species for thousands of years, from the natural obstacles to mixed breeds, from the persistence of the same anatomical type in both the tame and the wild state, and from the influence of climate in destroying no less than modifying animal races, denied even the Lamarkian scale of successive faunas as well as the passage of one into another, and favored the idea of a destruction and creation of species at each catastrophic epoch in the history of the globe.

And the same general reasoning has been pressed through all the anthropological sciences against the doctrine of human evolution. Distinguished physiologists, such as Valentin, Clark and Von Baer, have maintained that the fœtal development of man, so far from proving his animal pedigree, merely reflects that unity of plan which has pervaded the organic world from the beginning. And more recently, in his last lectures on the Method of Creation, Professor Agassiz has distinctly repudiated the use made of his discoveries by Darwin, Hæckel and Martin; averring that it would be as absurd to argue the material descent of cats from fishes at the present day, as in past epochs, because of any mere ideal correspondence in their fœtal development. Leading ethnologists such as Blumenbach, Prichard and Lawrence, long ago held that both savage and civilized man, like the wild and domesticated brute, retain the same anatomical structure in all climates, under all diversities of complexion and culture, and moreover, that the facial angle of Camper, ranging through fifty degrees from the low forehead of the ape to the vertical brow of the Apollo, though it may indicate a scale of races, affords no proof whatever of the physical evolution of one out of the other, but rather indicates, as the French Academy at length declared, a profound gulf, without connection or passage, separating the human species from every other. Eminent philologists also have set up language as an im-

passable barrier to such development. Wilhelm Humboldt claimed it as the distinctive faculty in man, of which no signs or rudiments can be found in the whole mute creation. Professor Max Müller, in his Science of Language, instead of referring its origin to mere animal cries or imitative sounds, which the dog and the parrot share with man, characterizes such explanations as the bow-wow and pooh-pooh theories, and traces all human speech to the faculty of reason as exercised in selecting, eliminating and combining certain phonetic types of thought, which are the roots of all languages. And the archæologists, until quite recently, have described primitive man as lapsing from civilization, through golden, silver, and brazen ages, rather than rising from barbarism through epochs of stone, bronze and iron. Champollion, Remusat, Humboldt and Schoolcraft, with their numerous associates in the study of ancient monuments and traditions, were inclined to regard the savage tribes of Africa, Europe and America as but the dispersed and degenerate descendants of the civilized races of Asia, such as the Egyptian, the Indian and the Chinese. The distinguished architect, Mr. James Fergusson, in his work on the Rude Stone Monuments of All Countries, maintains that we cannot get beyond the epoch of the pyramids; the cromlechs at Stonehenge and in other parts of the world having been erected by partially civilized races within the first ten centuries of the Christian era. Professor Piazzi Smyth of Edinburgh, in a recent work entitled Antiquity of Intellectual Man, according to his remarkable theory of the astronomical design and physical structure of the Great Pyramid, dates the historic epoch from a high state of scientific knowledge, about six or seven thousand years ago, and argues, from the premises of Lyell himself, that no other human remains than mere flint-chips and rude pottery, no civil monuments, such as coins, machines, statues, have been found in the caves and river-banks which archæologists are so busily exploring. The so-called archæo-geologists have also been met upon their own ground. Quatrefages, Pruner-Bey and Dawson have maintained that the famous Neanderthal skull is simply exceptional, if not already set aside by the older crania of Borreby, Engis and Mentone which indicate the exist-

ing Caucasian type of high forehead and steep facial angle; and that the most ancient remains of man which have yet been found, so far from proving his bestial origin, give hints of religious as well as savage ideas and manners.

To all this evidence against development has been added the proof of a positive degeneracy. Dr. Waitz admits, in his Anthropology of Primitive Peoples, that the first elements of civilization always appear as communicated from one people to another, and of none can it be proved how, when and where they became civilized by their own inherent power. The Duke of Argyll has lately published a treatise on Primeval Man, in opposition to the views of Lubbock, maintaining that the stone, bronze and iron epochs overlap and run into each other within the historic period, and the loss of ancient arts, and especially of religion, by such tribes as the Eskimo and the Hottentot, may have been due to adverse climate and the general corruptibility of human nature. Count Gobineau, in his work on Moral and Intellectual Diversity of Races, argues that as a dunce and a genius may be born of the same parents, certain branches of the human family are in a state of permanent inferiority, whilst others show a capacity for social improvement and civilization. Hugh Miller describes such inferior races as varieties which have lapsed from the Caucasian type, fallen, hopelessly lost, and as races doomed, after a few generations, to disappear. Mr. Westropp indeed acknowledges, not merely that there are some instances of degraded races, but that all civilized races are destined to a course of decline as well as progress, under immutable physiological laws. And if the notion of transmutation be thus separated from that of progression, or if it is admitted that successive species, languages and arts have been produced and extinguished in a series with an ever-advancing type, we can readily imagine the scale of civilized and savage humanity descending as well as ascending between the image of a God and the image of an ape.

As to the unity of mankind, there were also two hypotheses. According to the older view, all races have descended from one pair. It had been the ancient teaching of the Church, that Adam and Eve were created in the garden of Eden as the first parents of the whole human family; and the early an-

thropologists had been accustomed to trace back to them, through the three sons of Noah, the second father of mankind, all the nations, languages and arts which had overspread the earth. Adelung, thus proceeding upon the Mosaic ethnography, had imagined the first land divided from the sea to have been the high table-ground of Central Asia, where the Creator placed the first human pair on the gentle slopes of Cashmere, between snowy mountains and grassy plains, drained by rivers to the north, south, east and west, affording every variety of climate, plant and animal, and thus uniting all the characters of Paradise, the cradle of mankind. Linnæus, in a more scientific spirit, had conceived of an original continent, emerging from the universal ocean, like an island mountain, belted with climatic zones, stocked with the first ancestors of all plants, beasts and birds, and thus serving as a sort of central nursery, from whence, as the earth dried and became habitable, were propagated from one pair the different varieties of mankind, together with the floras and faunas found associated with them in appropriate climates. Blumenbach had declared that his five great branches of the human family, the Mongolian, Malay, European, Ethiopian and American, were no more distinct species than the numerous breeds of domestic swine, which all naturalists admitted were descended from the wild boar. Cuvier also had referred his three varieties of mankind, the Caucasian, Mongolian and Ethiopian, to a single Asiatic pair, maintaining that their white, yellow and black complexions are due to climate, food and habit, whilst their original unity was indicated by anatomical sameness and fertile intermarriages.

And later ethnologists, with increasing knowledge, made such oneness of nature and descent a matter of special study and vindication. Prichard, the first of English authorities on the question, in his elaborate volumes, argued physiologically, that neither the color of the skin, nor the texture of the hair, nor the shape of the skull, nor the angle of the face, nor the size of the brain, however endlessly varied, can constitute different human species; philologically, that the consanguinity and common descent of races are proved by the affinity and common origin of languages; and historically or archæolog-

ically, that the memorials, traditions and customs of all nations converge backward, from Africa, Europe and America, toward the same birth-place and ancestry, in Eastern Asia. Professor Müller, the great German physiologist, reasoned, from the wide geographical distribution of the same plants and animals in such endless varieties, that all human races, from the Negro to the Greek, belong to one sole species, propagated by the union of two individuals, though he doubted whether their origin in the same pair can now be determined from experience. Dr. Bachman, the chief of the American school, in his work on the Unity of the Human Race, sagaciously observed that cultivated plants, such as the vine, rice and wheat, and domesticated animals, such as the horse, the sheep and the dog, now everywhere associated with man, also originated with him at the same geographical centre in the eastern continent, and that to suppose him incapable of coping with the most opposite climates, would make him generically inferior to certain animal species, which have spread from pole to pole around the globe. And numerous other similar arguments may be found in the works of leading physiologists, such as Lawrence, Carpenter, Owen of England, Tiedeman, Weber, and Vrolik of Germany, Flourens and Quatrefages of France, and Pickering, Hall and Cabell of the United States.

The growing evidence of philology has also been made to corroborate the physical unity of the species. The two Humboldts very early recognized the comparative study of languages as a method, surer than either history or tradition, for ascertaining the affinity of the most widely separated nations, retracing the course of their migrations, determining their relative degrees of approximation to the primitive race and speech, and ultimately solving the whole problem of their dispersion from a common point of radiation. Dr. Latham, proceeding upon such principles in his elaborate works on the varieties and migrations of mankind, has grouped the three great races, Mongolidæ, Atlantidæ and Japetidæ, with three corresponding species of language, the monosyllabic dialects of Asia and America, the agglutinate dialects of Africa, and the amalgamate dialects of Europe, as in different stages of geographical and linguistic departure from the one primitive

Asiatic race and tongue. Professor Max Müller, in his Science of Language, whilst urging that the classification of races and languages should be independent of each other, holds to the common origin of both on separate grounds, and argues the possibility of tracing all existing dialects through the amalgamate, agglutinate, and radical stages back to one primitive speech, if not to one pair. The Chevalier Bunsen repudiated the notion that allied languages and races are not historically connected, but only ideally analogous, and in his Philosophy of Universal History endeavored to join together the African, the Polynesian, the American and the European with the Asiatic dialects as respectively but degraded, eccentric, arrested and advanced formations, which have proceeded, with migratory races, from the original seat of mankind, in northern Asia.

And the archæologists, in like manner, have long been endeavoring to trace the arts, as well as languages and races, to the same centre as the cradle of civilization. Authorities in the study of ancient history, such as Niebuhr, Wilkinson, Mommsen and Rawlinson, have derived all the culture, science and religion of Europe from Central Asia, through Egypt, Assyria and Greece; whilst Oriental scholars, such as Schlegel, Huc and Paravey, have referred to the same source the traditions of Hindostan, Thibet and China. American antiquarians, such as Schoolcraft, Catlin and Prescott have followed the Mongolian races from Japan across Behring Straits and through the Pacific islands to North and South America, and there sought to identify the Indian mounds and Mexican temples as of the same Asiatic origin with the cromlechs of Britain and the pyramids of Egypt. And other explorers, such as Ellis, Lang, Bradford and Pinkerton, reasoning from a similarity of traditions and customs, have traced the American aborigines from Asia, through Polynesia and Australia, over the widest part of the Pacific, and even from Africa as well as Europe, across the Atlantic, drifting in the kyac and the canoe, long before the modern voyages of Columbus and Magellan. Rector Rauch of Augsburg, among other valuable anthropological studies on the Unity of Mankind, has collected and digested the evidence of modern travellers, such

as Barrow, Davis, Assall, D'Urville, Beechey, Dieffenbach, Jacquinot, Wallace, in favor of the early peopling of the whole earth from the same geographical centre. To all this array of physiological, linguistic and antiquarian testimony, may be added that of eminent transmutationists, such as Lyell, Hæckel and Pouchet, who are ready to admit the possible and even probable descent of races from one pair, provided only the popular chronology be sufficiently lengthened to allow of a secular development from primitive animality through the stone, bronze and iron epochs of pre-historic barbarism.

According to the polygenists, however, different races are descended from different pairs. And the opinion, though not in a scientific form, is as ancient as its opposite. It was the boast of the Greeks and Romans that they were autochthonous, or terrigenous, sons of the soil, whilst all foreigners differed in nothing from the brutes. Plato excluded barbarians from his ideal republic, and Galen would not prescribe for the preservation of their young as being no better than the buffalo and the wild boar. But with the spread of Christianity, as a gospel for Jew and Gentile, Greek and Barbarian, this inhuman doctrine disappeared, and the common origin of races became so essential to orthodoxy, that Lactantius and Augustine even denied the notion of antipodes, because of its supposed inconsistency with the descent of all men from the same parents. It was not until geographical discovery had proved the round form of the earth, and made known to Christendom other and widely different races, concerning which history and Scripture appeared silent, that Paracelsus scandalized his contemporaries by asserting that there must have been an American Adam besides the Asiatic. And the scepticism grew scientific as the researches of naturalists brought to view the analogies afforded by indigenous plants and animals. Buffon had called attention to the great natural barriers to a geographical distribution from one centre, existing in wide oceans and adverse climates, as confirmed by the specific differences between American and Asiatic quadrupeds in the same latitude. Cuvier had shown from the evidence of palæontology that some of the domestic animals of Europe, such as the ox, could not have originated from the paradisaic centre in Asia.

De Candolle, in his classical treatise on Botanical Geography, had divided the earth into stations and habitations of plants, or localities and continents, each with its own peculiar vegetation termed a flora. Pennant and Waterhouse had parcelled out over the globe similar zoölogical provinces, each inhabited by its own nation of quadrupeds termed a fauna. Professor Forbes, in some memoirs on the connection of the British flora and fauna with the glacial epoch, had already announced his theory of specific centres or foci of creation, at which each species of plant and animal is supposed to have emanated from one pair and remained within the same area, except as dislocated by migration and geological changes. Linnæus, Buffon, and Blumenbach, moreover, as if unconsciously anticipating such views, had long before made geographical classifications of mankind, treating the several continents of Europe, Asia, Africa, and America, as distinct ethnological kingdoms, each affording its own variety or race of men.

And now it was but a logical step further, to consider the human species in different regions, as indigenous as the floras and faunas with which it is found connected. Eberhard, in a treatise on the Human Races, seems to have been the first to refer the five continental races of Blumenbach to as many botanical and zoölogical provinces, each of which had brought forth a human pair as the keystone of its whole organic world. Professor Agassiz, about the same time, in a memoir on the Geography of Animals and in his "Principles of Zoölogy," broached the idea that men are autochthons, originating, like plants and animals, on the soil where they are found, but unlike them created in one and the same species, or after the same primordial type; and subsequently, in his "Sketch of the Natural Provinces of the Animal World, and their relation to the different Types of Man," he divided the earth's surface into eight great zoölogical realms, producing as many distinct human species, though all with the same intellectual and moral nature. Doctors Nott and Gliddon embodied the views of Agassiz in their "Types of Mankind," and pushed them to their logical results, with still more boldness in their volume, "The Indigenous Races of the Earth," collecting scientific authorities, with a cyclopædiac range, from every related de-

partment in favor of a multiple origin of the human species. Dr. Morton, the chief authority on American crania, in the last named work, is cited as averring that the Indians are the true autochthons or primeval inhabitants of this vast continent, on the ground that our species had its origin not in one but in many creations, which diverging from their primitive centres have met and amalgamated as we now find them, with the extremes connected together by intermediate links of organization.

And besides the testimony of such professed ethnologists, special monographs and arguments have been brought from other connected sciences. Physiology is made to testify to the original diversity of species. Rudolphi, Burmeister, and Vogt suggested that the descent of millions of men from one pair in so short a time would imply incredible fertility, as well as leave the important matter of peopling the earth to mere hazard in distant regions and adverse climates. Desmoulins, Borey, and Hamilton Smith have reasoned from the phenomena of hybridity in animal species, that the existing mixture of human races does not imply their common parentage, but only a higher type of fecundity. Knox, Baudin, Kennedy, and Hunt have referred to the difficult acclimatization of the English in India and America, as proof that the different continental races are confined within climatic barriers which they cannot overleap without more or less speedy degeneracy and extinction. And other physiologists, such as Virey, Meigs and Brown, have argued positively for their diverse origin from differences of complexion, as the white, the yellow, and the black; of skull, as the long, the broad, and the round; and of brow, as high, low, and medium; whilst some, with Gobineau and Pouchet, have thrown into the scale a supposed psychical diversity of species, indicated by the mass or folds of the brain, and expressed in different mental capacities.

Philology has been cited as a witness for the plural origin of languages as well as races. Professor Agassiz, assuming all language to be an animal function predetermined by the vocal organs, argued from their structure in different races, that the primitive tongues of men were as distinct as the scream of the eagle, the song of the thrush, and the quack of

the duck. M. Alfred Maury, whilst admitting that allied tongues indicate allied races, denied that they point to a common origin for either, on the ground that the classification of races must precede that of tongues, and that any analogies between them, so far from indicating the same descent, are due to mere similarity of mental organization and condition, the same thoughts everywhere spontaneously expressing themselves in the same sounds and words. Professor Pott, the distinguished German etymologist, has written a treatise on the "Diversity of Human Races," based upon the assumption of a multiple origin of languages at points totally independent of each other. Mr. Crawfurd, late British Resident at the Court of Java, and author of numerous learned works on the Indian Archipelago, in opposition to Humboldt's view of a parent tongue for the Malayo-Polynesian races, maintained their separate origin, and explained any words common to their several dialects as the mere effect of maritime adventure and commerce; such as are now taking place on a larger scale among the more confused civilized languages. And Professor Schleicher has distinguished certain language-provinces over the earth, like those of the botanist and zoölogist; grouping together as an example the aboriginal dialects of America, which, unlike the mixed tongues of Europe and Asia, having been long secluded, still appear as indigenous as the tribes, animals, and plants where they are spoken.

Archæology, too, has been summoned to prove the plural origin of arts as well as races. Francis Pulsky, one of the collaborators of Nott and Gliddon, in his memoir entitled "Iconographic Researches on Human Races and their Arts," has endeavored to show that races are artistical in different degrees, and retain their respective arts, whether rude or fine, as indigenous products which cannot be transplanted or amalgamated. Mr. Buckle, in his History of Civilization, has illustrated the predominance of climate and locality over race, by contrasting the Mongolian hordes of Northern Asia with their kinsmen in Persia and China, who have developed the most flourishing monarchies of the old world. Tylor, in his "Early History of Mankind," contends for similar beginnings of language, writing, and culture in all parts of the globe,

insisting that the ancient American architecture, instead of betraying an Asiatic origin is native to the soil, and merely analogous to any that may be found elsewhere. South American antiquarians, such as Acosta, Waldeck and Dupaix, have ingeniously argued from the accumulated garden mould, the successive tree-growths and the scattered monumental ruins of Peru and Yucatan, for an antiquity dating beyond the Egyptian Pyramids, toward the highest pre-diluvian epochs. North American archæologists, such as Romans, Gallatin, and Squier, have been inclined to treat the Mississippi earth-works and Mexican ruins as purely native productions of indefinite age, bearing only accidental resemblance to the Celtic cromlechs and Hindoo temples. And some European scholars, such as Klaproth, and Waitz, from the similarity of Asiatic and American traditions and customs have simply claimed the new world as the early home of the Mongol races of Polynesia and Western Asia, and indeed as the cradle of civilization for the other continents. Dr. Augustus Le Plongeon, in a memoir on the "Vestiges of Antiquity," read before the New York Geographical Society, has proposed to explain the archaic resemblances among the pre-historic races of both hemispheres, on the geological hypothesis that this continent in its tropical regions became the seat of a primitive civilization which has ebbed and flowed around the globe, with the secular motion of the earth's axis, from America to Europe and from Europe back to America. In connexion with all this ethnological, philological, and archæological evidence, it should be borne in mind, that leading progressionists, such as Agassiz, Gobineau, and Quatrefages, whilst admitting a plurality of human races, deny their animal origin, and still adhere to the ideal, moral and religious unity of the species.

As to the destiny of mankind, there have also been two opposite presentiments. One class of anthropologists has looked for an indefinite improvement of the species. It had been an ancient prediction among both the Jews and Gentiles, that man, with the earth he inhabits, is to be renewed and his lost Paradise regained; whilst some modern Christians, as we shall see, have so literally interpreted the Messianic prophecies as to anticipate something like a physical

transformation of plants, animals, races, languages and arts at the second coming of Christ to renovate both nature and humanity. And this view, without its miraculous element, has occasionally assumed a color of scientific prevision. It has been suggested, and even argued, by the evolutionists of an advanced school, that the development of the globe, with improving climates, floras and faunas, favors a corresponding development of the human species toward a higher physical type than the animal and savage tribes, out of which its civilized races have already emerged. Sir Charles Lyell, remarking upon the geological changes which affect climate and species, has observed that man, in proportion as he occupies the earth, displaces certain animal tribes, as they have before displaced their ruder predecessors, and that a similar predominance of civilized over savage races renders it inevitable that in the course of a few centuries the Indians of North America and the Hottentots of New Holland will be remembered only in poetry or history. Mr. Alfred Wallace, consistently with his hypothesis, has argued that we may foresee a time when only cultivated plants and domesticated animals will remain, and human selection will have replaced natural selection everywhere except in the sea, in order that man may acquire his proper dominion over the whole habitable world. Mr. Darwin also has remarked, in accordance with his doctrine of survival, that human races, like the different animal species, are evolved one out of another, the weaker ever exterminated by the stronger; and his more eager disciples are already predicting an era when savage and barbarous peoples, no longer able to maintain themselves in the struggle of existence, will have faded away before the progress of civilized races throughout the earth. Dr. Büchner especially, in his work on the Man of the Present, Past and Future, has collected the testimony of the school for a sort of physiological prognosis of the human species, as it will appear, at the close of the whole organic development of the planet, in an artificial Paradise or earthly heaven of its own creation.

Besides such systematic treatises, there have been bold conjectures and brilliant surmises to the same effect, gathered from the different anthropological sciences. Some writers, on

physiological grounds, have predicted ever-improving races. Tiedemann, Grégoire and Armistead have written arguments and appeals in favor of the indefinite improvability of the Negro, citing examples of individuals of that race who have attained the greatest proficiency in the arts and sciences. Crawford, Krieg and Cooley have argued that miscegenation, or the mingling of different races, instead of causing any of them to deteriorate, elevates the lower to a higher degree of physical and mental vigor, as may be seen in the successive reinforcement of the European nations and the American colonies with Roman, Celtic, Norman and Saxon blood. Francis Galton, in his essay on "Hereditary Genius," has framed a statistical argument to prove that the qualities of great men, instead of being accidental or anomalous phenomena, are directly traceable to parentage and ancestry, and transmissible, with augmented power, by means of judicious marriages; referring to ancient Athens as a city stocked with a breed of heroes, whilst modern Europe has lost its race of saints through the celibacy of the clergy. Dr. Prichard, from a historical comparison of British skulls at different periods, has concluded that the present race of Englishmen have larger brain-cases than their forefathers. Carl Vogt professes to find in the brain itself, as the organ of thought and culture, a capacity of indefinite improvement, both in structure and function, which, under the laws of descent and training, may be propagated, with cumulative force, from generation to generation. And Mr. J. W. Jackson, treating our species as only the commencement of a new zoölogical order of mammalia, has ventured to prognosticate the future man as endowed with new physical organs and appendages, realizing the ideal angel of Eastern fancy.

Philological writers have predicted ever-improving languages as well as races. Leibnitz, the Empress Catherine and the Adelungs seem to have had before their minds, as a possible fruit of their comparative studies, the discovery or invention of a common universal language, hidden amid the confused tongues of mankind, or to be constructed, by international intercourse, as a bond of ultimate unity. Bunsen, Lepsius and Müller, in the year 1854, united with other distinguished lin-

guists in a conference called to devise a Standard Universal Alphabet, in which the different vocal sounds shall be defined physiologically, according to the organs of speech, as gutturals, dentals and labials, and expressed typographically by the fewest possible letters, to serve as an instrument of scientific study and human advancement. Schleicher, Grimm and Bleek, consistently with their view of language as an animal faculty of gradual growth, would look forward to its progressive improvement with the improvement of the brain and larynx, or increasing capacity of thought and expression in coming generations. Professor Whitney, of Yale College, is such an enthusiastic admirer of English, that he has declared in his "Study of Language," his belief that it will not be found unequal to anything the future may require of it, even though it should become the leading tongue of civilized humanity.

Other writers, on archæological and geographical grounds have anticipated ever-improving arts as well as races and tongues. Maclaren, in the article on America in the Encyclopedia Britannica, has intimated, that the new continent, though not half the size of the old, were its resources as fully developed, would be capable of sustaining five times the present population of the globe. Professor Marsh, in his "Man and the Earth," treating of physical geography as modified by human action, has projected still further and grander changes, to be brought about by vast industrial enterprises, reclaiming barren and insalubrious regions, connecting the commerce of distant oceans, as at Suez and Darien, and even improving the climates of the different continents. Mr. Carey, in his "Social Science," reasoning from the principles of agriculture, chemistry and political economy, in opposition to Malthus, maintains that the treasury of nature is unlimited, the supply ever increasing with the demand, and the demand ever increasing with the multiplication and combination of mankind. Dr. Schaafhausen argues that in proportion as man rises out of the animal state, he emancipates himself from all climatic and local conditions, becomes concordant and cosmopolitan in his culture, and steadily approximates an ideal unity of thought, feeling and endeavor which, though it could not have existed at the origin of the race, now shines

before us as the brilliant goal of the human development. And still bolder prognosticators, such as Jackson, Figuier and Flammarion, leaving the earth as at length to be survived or outgrown by man, have fancied the human species, under progressive laws, with new physiological characters, migrating to the sun, for a higher cosmical stage of life, and thence even to the stars, as other suns, of which the planets are but embryos. There is certainly ample scope in such heavenly worlds for the wildest dreams of human progress.

Another class of anthropologists, however, have looked for the ultimate extinction of the species. According to the ancient traditions, the golden, silver and brazen ages of mankind, being indicative of a career of moral degeneracy, terminate in a deluge or conflagration, as a divine judgment, by which the corrupt race is destroyed; and times of great social depravity have naturally been regarded as ominous of decline and speedy extermination. The Roman satirists thus predicted the decadence of the empire. The dissolute followers of Louis XV. are said themselves to have exclaimed, on the verge of the French revolution, "After us, the Deluge!" And sceptical philosophers, such as Montesquieu, Voltaire and Volney, have speculated in a like spirit upon the general decay of nations and fall of empires as the inevitable fate of mankind. But some more scientific observers, apart from all sacred or profane prediction, have fancied physical rather than moral causes of extinction, in a declining vitality of the earth, with all the floras, faunas and races which it sustains. Eminent astronomers, as we have seen, have declared that a time must come, when our planet, from the dissipation of its own internal heat or the cooling down of the solar fires, will have become shrouded in universal winter and rendered, like the moon, uninhabitable by man or any living thing. Geologists, also, have predicted great catastrophic revolutions of the terrestrial surface by flood or fire, destroying all existing animal or human life. Botanists and zoölogists, such as Brocchi and Naudin, independently of any astronomical or geological causes of extermination, have maintained that the primitive vigor or prolific virtue of every species of plant and animal, like an expended force, is on the decline and must, sooner or later, die

out in weakness and sterility; whilst others, with Fleming, Wallace and De Candolle appear to have argued that cultivated plants, domesticated animals and civilized men, besides displacing and extirpating as many wild species, only impoverish more than they enrich the lands upon which they depend for sustenance, and so must ultimately exhaust the general treasury of nature.

And on the basis of such inductions the anthropological sciences seem to be already adjusted for a general prognosis of human extinction. Ethnology has brought a presage of declining races. Tschudi, Humboldt, the Kanes have told us of long extinct peoples in Peru, of decaying populations in Mexico, and of starving Eskimos at the Arctic pole. Schoolcraft, Hochstetter and Pöppig, among many others, have argued that the aboriginal savages of the North and South American States are steadily disappearing before the march of civilization, whilst the Spanish, French and English races which have supplanted them, according to Knox, Baudin and Kennedy, are themselves but doomed to perish, after a few generations, in the disastrous process of acclimatization. Gobineau, Pouchet and Nott have maintained that the amalgamation of races, so far from improving them, tends to their physical deterioration and speedy exhaustion, through infertility, as may be seen in the Spanish creole, the American mulatto and the Indian half-breed of Mexico and Canada. The French ethnologist, Virey, at the close of his volumes on the Natural History of the Human Race, has denied that there can be any "megalanthropogenesis," (or breeding of great men,) referring for proof to the obscure descendants of Socrates, Cicero and Charlemagne, and to the proverbial degeneracy of royal and noble houses, amid all the appliances of European civilization. Dr. Maudsley, treating of brain diseases, maintains that brilliant wit and genius, as in poor Charles Lamb, are not seldom symptomatic of an insane temperament which, if propagated, can only issue, after a few generations, in madness, idiocy and extinction. Dr. S. Weir Mitchell, in his timely paper entitled "Wear and Tear," has sketched a suggestive picture of the cerebral exhaustion and decline of ancestral vigor, attendant upon our higher culture. And thoughtful far-seeing observers

in all civilized nations are foretelling an Iliad of woes as the inevitable result of the luxurious vices which are slowly sapping the brain and virtue of the noblest breeds of men.

Philology also has uttered a prediction of steadily declining languages. Jesuit and Protestant missionaries in America, Africa and Asia, for several centuries, have been reporting innumerable savage dialects already perished or perishing with the tribes which use them, not only without a literature, but without even such a memorial as the Eliot Bible of Massachusetts. Latham, Lepsius and Bunsen, by their hypothesis of a primitive Aryan language in Asia, seem to agree with the early linguists, in treating all the barbarous tongues of the scattered family of mankind, as only decaying fragments of the pristine speech of Eden, or dying echoes of the great jargon at Babel. Schlegel, Bopp and Grimm have traced the genealogy of the dead languages, which have flourished in succession from the banks of the Ganges to the shores of Spain, the Sanscrit, the Hebrew, the Greek, the Latin and the Celtic, now lingering like ghosts amid the effete nations which once spoke them, whilst even the modern literary languages which have supplanted these ancient classics, such as the Italian, the Spanish, the French, the German and the English, according to Max Müller, are themselves likewise doomed to inevitable decay, except as reinforced by the new blood of vulgar speech. And purists in all languages are sighing over the decline of classic models and the reign of slang as but signs of returning rudeness and general corruption.

Archæology, too, has furnished a precedent of declining arts as well as races. The conservative school of antiquarians, with more or less distinctness, seems inclined to regard all barbarism and savagism as mere decaying and putrid fragments of a primitive civilization, from which different peoples and tongues have lapsed through physical degeneracy or adverse climate and situation, and to represent all existing civilization as destined to a like decay from like causes. The Duke of Argyll, as we have seen, thus explains the decline and loss of primeval art among barbarous and savage nations. Mr. Wendell Phillips, in one of his popular lectures, has exalted the lost arts of antiquity over any modern handicraft. Dr.

Joseph P. Thompson, when discoursing upon the wonders of Egyptian civilization, thought them fitted to destroy the conceit of the proudest capitals of modern times. And even at the height of our boasted material progress, some English economists, of the school of Malthus and Ricardo, have been foreboding an industrial decline, consequent upon a gradual increase of population beyond the sustaining powers of the soil, and the natural supplies of coal, iron and other means of physical life and progress. In a word, if we listen to such gloomy vaticinations, we must believe that all human races, languages and arts are but doomed to extinction, and man himself, as he exhausts the earth, only destined to bury himself in its ruins.

The complex problem of the origin, development and destiny of human races, languages and arts is not only staked upon the geological theory of the whole terrestrial evolution, but brings a mass of confused details, more hypothetical as yet than strictly scientific in their grouping. Notwithstanding the vast crude information gathered by ethnologists, linguists, and archæologists from all ages and countries, such investigators, as we have seen, are by no means agreed in their use of the same facts, but are divided into hostile camps on the scientific field, and sometimes even embittered with social prejudices and political passions. As yet, therefore, their speculations could have only a problematical bearing upon the revealed truths and doctrines of the science.

In the revealed section of the same science we shall find corresponding departures from the rational theory of mankind. In the first stage came the rejection of portions, at least, of that false scientific anthropology which had very early crept into the Church. Though the study of races, languages and arts was largely prejudged by an authoritative exegesis, there appeared divines, now and then, sagacious or fortunate enough to foresee and welcome more scientific researches. The Irish St. Virgilius in the ninth century, dared to advocate the theory of antipodal races, when all Christendom believed it a mere heathen myth, inconsistent alike with the locality of hell and our descent from Adam. Thomas Aquinas, with

other schoolmen, seems to have taught in his "Summa," that mankind was created potentially or derivatively under physical law, and not, as most modern theologians hold, by an instantaneous fiat or miracle. Calvin, in his "Genesis," whilst exalting the divine image in unfallen man, did not scruple to draw a lesson of humility from his previous origin in the ground, and even insisted upon his gradual formation as his peculiar distinction among animals. Turrettin, though he fixed the date of the human epoch to the day in the civil calendar, was nevertheless wise enough to premise that the whole question is chronological rather than theological. Isaac Peyrère, first a Protestant infidel, then a Catholic priest of the Oratory, endeavored to explain the origin of the newly discovered North American races in a "Theological System according to the Pre-adamite Hypothesis," which, had he not recanted it, might have distinguished him as the forerunner, if not the founder, of the school of Forbes and Agassiz. Bishop Butler, in his "Analogy," with rare forethought, appears to have started several questions of recent anthropology, such as the material origin of man, his development from an animal state, and his gradual predominance as the governing animal in our globe. Bishop Berkeley, also, in his Alciphron, though maintaining the received Mosaic chronology, treated of the invention of arts and sciences, and the peopling of the world in the light of Egyptian and Chinese traditions, with the learning and spirit of a modern antiquarian. President Stanhope Smith, of Princeton College, at the close of the last century, published a work, still quoted among ethnological authorities, on the "Causes of the Variety of Complexion and Figure of the Human Species," advocating the theory of climatic influences, in opposition to Lord Kames, and in agreement with Cuvier and Blumenbach. The Spanish Jesuit Hervas, at the beginning of the present century, digested the linguistic reports of his missionary associates from all parts of the world, in a voluminous "Catalogue of Languages," containing six hundred dialects, discarding Hebrew as the primitive speech, and anticipating discoveries since associated with the names of Humboldt and Bopp. And during the present century, as an incidental fruit of Protestant missions, a host

of investigators throughout the heathen field, such as Heckewelder in America, Moffat in Africa, Morrison in Asia, have been contributing ethnological, philological, and archæological data for re-casting the whole Scripture doctrine of the First and Second Adam, as including in one blood, and speech, and creed, every kindred, and tongue, and people under the heaven.

During all this time, however, the great majority of divines, unconscious of the newly forming scientific anthropology, remained attached to the ancient dogmas respecting the original perfection of man, his probation and fall in Adam, and the predicted new race in Christ. As to the first of these doctrines, Pagan, Hebrew, and Christian traditions seemed to have converged backward to a common primitive state of purity and happiness. According to the doctrine of the Zend-Avesta, Ormuzd, the good genius, reigned alone during the first age of the world, in a land of delight and plenty, until the first man ate of the Hom, a tree guarded by myriad angels, when Ahriman, the evil genius, entered the happy realm, and brought death to men. The Chinese had their tradition of a garden in the midst of the mountains, on which perpetually flowed the fountain of immortality, dividing in four streams, as the source of all life. The paradise of the Egyptians was upon a steep mountain on an island, where Osiris was born and lived with his sister and wife Isis, with abundance of corn and wine, amid perennial fruits and flowers. Hesiod, Apollodorus, Ovid, Juvenal, and other Greek and Latin poets, had embellished various myths, which were regarded as only distorted reminiscences of lost paradise, such as the image for the first man formed by Prometheus out of moist earth, whilst the winds breathed life into it at the command of Jupiter; the gifts of Pandora endowed, like another Eve, with every divine blessing, but also with the fatal casket of all human woes; the nectar or ambrosial food of the gods of which no mortal dare taste; the garden of the Hesperides, with its miraculous trees and golden fruit, enclosed with walls and guarded by a dragon; the old Saturnian age of innocence when men and animals conversed together in a state of nature; and the pure and blissful Atlantides or Hyperboreans,

who in a clime of perpetual sunshine knew no discord, sickness and death. The rabbins had indulged in endless speculations respecting the divine image in which man was created. In the apocryphal Book of Wisdom he was described as endowed with an immortal body, with dominion over the earth, and with moral uprightness of soul. Sirach included in this divine likeness, together with authority over the animals, the gifts of reason, speech, and other excellencies. Philo, consistently with the Platonic view, placed the image of God in the rational soul, considered as a reflection or embodiment of the divine reason or logos. And the cabalists generally attributed to Adam, not only extraordinary physical strength and beauty, but a fabulous amount of scientific knowledge, expressed in the names he applied to natural objects, and handed down in the very etymology of the Hebrew, which they regarded as the divine language of Eden. The Church fathers had also delighted to magnify the physical and mental perfection of Adam. Tertullian, Melito, and Audæus, combining materialistic views of the soul with anthropomorphic views of the Deity, sought for the divine image in the mere bodily structure and appearance, especially the human face divine, which before the fall was supposed to be unspeakably majestic and luminous. Chrysostom, Athanasius, and Gregory of Nyssa, dwelt upon the more refined conceit which placed it in the godlike dominion of man over nature, as well as in the rational control which he exercises over his own animal passions. Irenæus, Clement, and Origen, finding the chief seat of the divine image in the soul of man, were naturally led to regard his noble countenance and regal dominion as but external expressions of that inward likeness. Augustine, as if combining these views, endeavored to discern in the threefold constitution of body, soul, and spirit, that which could be regarded as a miniature reflection of the Trinity. And nearly all the fathers distinguished, according to Genesis, between the image and the likeness of God; the former being original and potential, and the latter acquired and developed.

The schoolmen proceeded to refine these distinctions with still more subtlety. John Scotus, Hugh of St. Victor, and Alexander Hales placed the image of God in that natural

or essential humanity, possessed both before and since the fall, whilst the likeness of God was included in those supernatural additional gifts of righteousness, immortality, and honor which have been forfeited and lost. Peter Lombard, in his Sentences, referred the former to the mental faculties or knowledge of truth, and the latter, to the moral affections or love of virtue. Bernard pushed the distinction so far as to declare that the image of God even in Gehenna might ever burn, but could not be consumed, as it pertains to the very essence of the soul, which, though without the moral likeness of Divinity, would still reflect His intellectual nature. Aquinas admitted the distinction, but held that it was more verbal and logical than actual, as man before the fall had never been in the mere natural state, without grace as well as without sin. Berthold, and other mystics, fancied a sort of a divine superscription or signature on the very face of man, the eyes and connected brows, ear, nostrils and mouth, together outlining with flourished letters the phrase "homo Dei." And all the schoolmen engaged in the most absurd discussions concerning the physiology, language and knowledge of Adam and Eve, and what these would have become had they not fallen from paradise. Roman Catholic doctors at the Reformation simply accepted and emphasized the patristic and scholastic anthropology. The Council of Trent made it a damnable heresy to deny that Adam through his disobedience lost that righteousness and holiness in which he had been constituted. Bellarmin claimed the whole testimony of the fathers, including Augustine, for retaining the divine image in fallen man, and referring the divine likeness to that original righteousness, which was like a festive garment of which he has been denuded, a splendid dowry of paradise which he has forfeited, a virginal wreath of which he has been despoiled. And Suarez cited to the same purport the authority of Aquinas and the schoolmen. Protestant divines endeavored to redefine the image of God with some new distinctions. Luther maintained that the whole moral as well as intellectual likeness was concreated in Adam, and has been lost by the fall; the rational soul itself, as it now exists in man, being but a corrupt inheritance. Hollazius included in the original

divine image the attributes of knowledge, righteousness, holiness, immortality, and majesty, and defined it as an accidental likeness in distinction from that essential likeness pertaining to the Eternal Son alone, as the express image of the Father's person. Calvin carefully animadverted upon the gross physical image of Tertullian, the refined intellectual image of Chrysostom, and the subtle trinitarian image of Augustine, maintaining that these are but expressions or scintillations of that true moral image which had its chief seat in the heart, and thence irradiated the intellect and transfigured the body. The Reformed Theologians also discriminated between the essential and the accidental image of God, and whilst admitting a certain extant physical and intellectual likeness of Deity, blurred and marred by the fall, held that the whole moral image has been utterly obliterated, and can only be supernaturally restored by a new creation in Christ Jesus. It was not possible as yet to institute any scientific correspondences, such as are now broached, between the savage and the paradisaic state, or between the pre-historic ages of the archæologists and the antediluvian arts described in Genesis.

As to the fall of mankind in Adam, there had also been a general concurrence of theological opinions before and since the Christian era. All Gentile traditions, the Persian, the Indian, the Chinese, the Egyptian, the Greek and Roman, seemed to point back to a primitive apostacy, like so many broken links of a chain, remotely connecting with some one head of the whole human family. The rabbins had thus explained the universality of death and sin. In the Chaldaic paraphrase of Ruth, it was taught that because Eve ate of the forbidden fruit, all the inhabitants of the earth are subject to death. The Son of Sirach declared that of the woman came the beginning of sin, and through her we all die. And the Talmudists generally vindicated the suffering of saints and infants, with other descendants of Adam, as but an illustration of the Scriptural principle that the iniquity of parents is visited upon children from generation to generation. The Greek fathers dwelt upon the physical effects of the fall, whilst the Latin fathers traced its moral consequences. Justin, Clement and Chrysostom

variously characterized the sin of the first pair as pruriency, voluptuousness and vanity, into which they were seduced by Satan, and in consequence of which their descendants became mortal, diseased and accessible to temptation. Tertullian, Ambrose and Augustine taught more explicitly that the human race was contained in the loins of the first man, that all men have sinned in Adam, their representative, as well as progenitor, and have, therefore, not only inherited his corrupt nature, but actually incurred the guilt of his transgression, together with its consequent miseries, both in body and soul. And this general difference between the Eastern and Western Churches became more pronounced and extreme within the latter Church by the controversy with Pelagius, who held that Adam's sin injured no one but himself, except through its example, and that all men are born innocent and morally healthy. The schoolmen ranged themselves between Augustinism and Pelagianism. Anselm and Aquinas held that the sin of Adam, with the loss of his original righteousness, was imputed even to unbaptized infants and pagans as a moral guilt, rather than as a mere physical inheritance; while Abelard and Duns Scotus taught that such classes were only involved in the punishment of that first transgression, since all sin consists in voluntary acts. And the mystics and early reformers, such as Wessel and Savonarola, though referring the consequences rather than the guilt of Adam's sin to his descendants, viewed their actual transgression as but an imitation and repetition of the original fall. At the Reformation, while the Catholics as a body reverted toward Pelagianism, the Protestants advanced to an extreme Augustinianism. Jansen, Arnauld and Pascal, who in this respect were but Protestants within the Roman Church, restored and defended the doctrine of Augustine, in its most uncompromising form, against that of Pelagius. Luther and Melancthon, in their formularies, taught that the corruption of human nature, propagated from Adam, was so complete and profound, as to involve the entire loss of the divine image and extend to all the higher faculties of the soul, heart, mind and will. Calvin and Beza, in their Confessions, more explicitly held that Adam's sin was directly imputed to his posterity, so that his fault was also our own, and by a just

judgment of God we were condemned to be born utterly corrupt and depraved. The Westminster standards, taking Adam to be the federal or representative as well as natural head of the human race, declared that the covenant being made with him, not only for himself, but for his posterity, all mankind, descending from him by ordinary generation, sinned in him and fell with him in his first transgression. And this became substantially the doctrine of the chief evangelical Churches of the last century. It was too soon as yet to attempt any scientific verification of these dogmas, such as is beginning to be made, by associating co-Adamite and pre-Adamite theories of the savage and animal origin of man, with a special divine dispensation to Adam as the natural progenitor of the Caucasian race and federal representative of the whole human family.

As to the new race in Christ, the second Adam and Lord from heaven, it had been the general faith for centuries that our Saviour became the type as well as founder of a restored and perfected humanity, predestinated to be conformed to His image. While all the sacred traditions of the Gentile nations streamed backward in melancholy retrospect of lost paradise, the Messianic prophecies among the Jewish people, in marked contrast, reached forward in joyful expectation of a new economy, which would restore and far excel the glory of the old. And though among the early Christians, the two rival Judaizing and Hellenizing factions, the Ebionites and the Docetæ, in defining the doctrine of the God-man, soon began to exaggerate His humanity at the expense of His divinity, or His divinity at the expense of His humanity, yet during the subsequent ages of the Church, at length there grew up the orthodox dogma of the two natures, divine and human, in one and the same person. The fathers, the schoolmen and some of the reformers have since indulged in numerous subtle speculations upon the mysterious union of these two natures in Christ, but all have been agreed that by taking unto Himself a true body and a reasonable soul He became man, and, like another Adam, was the federal head or representative of a new regenerate humanity, first exemplified in His own person and yet to be extended to the whole race of mankind.

The attempts to find a scientific basis for such dogmas belong to the speculative Christology of a later day. They include ingenious speculations on the physical powers of regenerate humanity in the predicted new earth or restored paradise; but as yet have received no strictly dogmatic definition.

Anthropology, rational and revealed, as now surveyed, presents to us a growing mass of facts and truths grouped together in the special sciences of ethnology, philology, archæology, with a series of hypotheses and of dogmas more or less accordant as to the origin, development and destiny of races, languages and arts. As yet, neither the hypotheses nor the dogmas hold the entire field of controversy. It remains to be seen whether either shall prevail against the other, or if both may not yet be so sifted and blended together as to yield one congruous rational theory and revealed doctrine of mankind.

As we extend our survey into the psychical sciences we shall find their contents becoming even more crude and confused than those of the physical sciences. Not only are the two empirical and metaphysical provinces less clearly defined, but the facts and the truths, the theories and the doctrines, the hypotheses and the dogmas which they severally contain, are more subtle and involved. The metaphysical province of each science is much larger than its empirical province, and consequently its problematic portions much greater than its ascertained portions. While the dogmas are of long standing, sharply defined and authoritatively maintained as vital tenets, the hypotheses are new and obscure, and often so menacing that they must plead even for a hearing. Moreover, we are entering a region of human interests and passions, where the very phenomena under investigation may become colored and distorted, and where the mere personal equation, as astronomers term it, may throw the whole problem into endless error. It is scarcely possible to study ethical, social and religious facts in the strictly philosophic mood. Notwithstanding, however, all these difficulties, it will be found that the scientific spirit has been steadily advancing in the psychical sciences, and through the same historic stages as in the physical sciences.

SECTION IV.

Psychology, Rational and Revealed.

In the rational section of psychology, during the legitimate stage of healthful separation and progress, came the decline of the false biblical psychology of the mediæval Church. It was the period when the ghosts, witches and demons, which had so long haunted the region of the soul, were fleeing before the dawn of free thought, and the human mind, escaping from its cloistered reveries, began to observe inductively its own phenomena, faculties and laws. In the face of the ecclesiastical statutes and maledictions against witchcraft, John Weir, a humane physician of Cleves, and Reginald Scott, an enlightened English lawyer, had opened the way to medical psychology by exposing the frightful atrocities inflicted upon lunatics, and urging that they be treated as patients, rather than as mere demoniacs and criminals. The sceptical movement of Montaigne had combined with Protestant attacks upon monasticism, penance and purgatory, to clear the whole field of psychological research. Lord Bacon, too, had already sketched, among his reconstructed sciences, more exact theories of body and soul, with a logic and ethics which should treat of the intellect and the will, and though he applied his new organon mainly to physics, had expressly held it to be also applicable in the psychical region to the operations of memory, judgment, anger, fear, shame, as well as those of heat, light and vegetation. René Descartes, usually claimed as the founder of modern psychology, returning to the standpoint of Augustine, had given the death-blow to the whole scholastic pneumatology, with its complex series of vegetative, appetitive, sensitive souls, by sharply distinguishing the thinking mind from the animal body as a separate entity, and treating of its ideas, volitions and affections as purely immaterial phenomena. Benedict Spinoza, as a disciple of Descartes, in his profound treatise upon Ethics, had explored those fundamental relations between psychology and ontology, which have filled so large a space in all subsequent philosophy, from

Leibnitz to Hegel. Thomas Hobbes of Malmesbury, in his crude treatise on Human Nature, at the same time disclosed those superficial relations of psychology with physiology, which have since been so much more scientifically treated by Hartley, Erasmus Darwin and Maudesley. John Locke, as a follower of Hobbes and opponent of Descartes, then led the way, by his famous Essay on the Human Understanding, to the inductive investigation of the intellect itself, with inquiries into its powers of sensation and reflection, and into the origin and association of the ideas they afford. Anthony Asthey Cooper, Earl of Shaftesbury, as a friendly critic of Locke and forerunner of Hutcheson, in his elegant "Inquiry concerning Virtue," restored to ethical psychology the theory of a moral sense or natural perception of the sublime and beautiful in moral actions. Godfrey Leibnitz, in his "New Essays on the Human Understanding," sought the just mean between Descartes and Locke, whilst by his "Monadology" and "Pre-established Harmony," he probed for the first time the essential relations of body and soul. Christian Wolff, as the pupil of Leibnitz, assigned mental science to its due place in the philosophical encyclopædia, not only distinguishing it from anthropology, under the name of psychology, which it had borne since the time of Goclenius, but further dividing it into rational and empirical psychology. Alexander Baumgarten, also of the Leibnitz-Wolfian school, wrote the first treatise, infelicitously styled "Æsthetic," treating of the imaginative taste or faculty of perceiving and judging the beautiful in nature, in art, and in literature, since investigated by Kaimes, Burke and Alison. David Hume, meanwhile, as the astute critic of Locke, in his "Enquiry concerning the Human Understanding," had won the distinction now accorded him, of discovering that Scylla of scepticism, upon which a mere empirical psychology must ever be stranded. Immanuel Kant, as the subtle critic of Hume, then achieved in his "Critique of the Pure Reason," the corresponding merit of disclosing that Charybdis of mysticism, in which a mere rational psychology cannot but be whelmed, by maintaining our knowledge to be the sheer product of our own cognitive faculties, which he described as threefold; the sense, with its intuitive forms

of time and space; the understanding, with its conceptive categories of quantity, quality, relation and modality; and the reason, with its regulative ideas of God, the soul and the world, pronounced theoretically false, though practically true. At length Sir William Hamilton, as the erudite critic of all schools, in his "Discussions," "Dissertations" and "Lectures," may be said to have organized scientific psychology, by classifying the mental phenomena as cognitions, feelings and volitions, by treating systematically of the corresponding mental faculties, and by formulating the corresponding mental laws which constitute the psychological sciences of Logic, Æsthetics and Ethics. And since that time, a host of eager investigators from different points of view, such as Spencer, Bain and Maudsley, Jouffroy, Ribot and Janet Hickok, Porter and McCosh, Ulrici, Brentano and Lotze, have been pursuing the scientific study of mind, considered as a subtle organism, regulated by physical and mental laws.

During all this period, however, in the second stage of indifference, was growing up a mere speculative psychology, in place of that true biblical psychology which still held its ground. For the Scripture doctrines of the creation, regeneration and glorification of the soul, were gradually substituted various conflicting hypotheses concerning its origin, development and destiny. As to the first of these problems, there arose the two rival schools of spiritualists and materialists. According to the former, the mind is essentially immaterial. It had been long taught in the Church, by fathers and schoolmen, such as Augustine and Aquinas, that the soul is a pure spiritual essence, created in the body at birth and separable from it at death; and the early psychologists endeavored to use this dogma as a scientific theory, with more or less freedom from religious prejudice. There were at first general assertions of the mind's separate subsistence. Count Mirandola, at the very dawn of Italian learning, as a Platonist, had defended the spirituality of the soul with ascetic rigor. Sir John Davies, expressing English opinion before Hobbes, in a philosophical poem entitled "Know Thyself," described the soul of man as self-subsistent, independent of the senses and humors, wielding the body as its instrument and diffused

through all its parts like the morning light through the transparent air.

But by degrees the spiritualistic movement became more scientific. The first step was simply that of sundering mind from matter. Descartes, the father of systematic spiritualism, in his "Meditations," with the terse motto "I think, therefore I am," defined the mind as a something which thinks, or a thinking substance, in distinction from matter, which is an extended substance, compounded and divisible. Sir Kenelm Digby, one of the brilliant writers of the day, soon afterwards published at Paris "A Treatise declaring the Operations and Nature of Man's Soul," in which he distinguished mind from matter as an immaterial or spiritual substance, without parts and local motions. The English Platonists generally, such as Henry More, John Smith and Norris, also maintained the Cartesian definition of the soul, though with apologetic motives; and were followed by a long train of controversial writers, lay as well as clerical, such as Lowde, Burthogge, Fleming, and at length Andrew Baxter, whose "Enquiry into the Nature of the Human Soul" was designed to maintain its immateriality on the ground that matter is inert, without self-action, and movable only by some spiritual being.

The next step taken was that of rendering matter like mind. Leibnitz, advancing between Descartes and Locke, in his "Monadology," or Doctrine of Atoms, towards the views of the English physician, Glisson, on the energetic nature of substance, and of Cudworth, on the plastic force in nature, conceived matter, in its essence, to be as living and percipient as mind, and defined the soul a conscious monad or thinking force, in distinction from mere material monads or vital forces, such as animals and plants. Wolf adopted the Leibnitzian definition of matter and mind as metaphysical points, but denied that material monads are percipient or can have ideas. Kant, agreeing with Hume rather than with Wolf, in his "Critique of the Pure Reason," held the soul to be an inscrutable substance, whose immateriality can neither be proved nor denied; yet in a work entitled "Psychical Monadology," he boldly conjectured that the mind perceiving and the thing

perceived, the internal and the external substance, may both be thinking essences, homogeneous and co-percipient; thus approximating the spiritualism of Leibnitz. The final step has been that of reducing matter to a mere psychical manifestation. Berkeley, it will be remembered, had argued that there exist nothing but percipient minds and their ideas, or spiritual substances and their phenomena. Schopenhauer, in opposition to Kant, held the soul to be immediately knowable, by internal perception, as a conscious will, supporting phenomena, and pronounced materialism impossible, according to the axiom, "No object without a subject." Fichte, Schelling and Hegel, taking the idealistic road from Kant, lost themselves in a kind of universal spirituality of both mind and matter. Herbart, Beneke and Lotze, taking the realistic road from Kant, have described the soul respectively as a spaceless essence, acting at a single point, as an immaterial nucleus of psychical forces, as a conscious monad or spiritual atom, coexisting with a plurality of conscious and unconscious atoms. It will be observed that the spiritualistic movement, at its extreme, tends to convert all matter into mere mind.

According to the rival school, however, the soul is essentially material. And the opinion is as old as its opposite. It had been held by Democritus and Epicurus that the mind is but a composition of etherial atoms, such as air and fire, which is dissolved and lost at death; and this notion, as derived through Lucretius and Seneca, had apparently been countenanced by Tertullian. But with the rise of the Christian dogmas of carnal depravity and the separate disembodied state, it gradually disappeared during the middle ages, to be revived only by successive conquests of physical speculation over religious prejudice. The movement began with inquiries concerning incorporate spirit. The Italian Pomponatius, as an Aristotelian, may be said to have led the way, by his conception of an animating soul inseparable from the body. Campanella described the soul as a corporeal spirit, subtle, luminous, deriving all its knowledge through the senses. It was one of the maxims of Montaigne, that the senses are the beginning and the end of all knowledge. John Chrysostom Magnen, a French professor at Pavia, embodied the growing

sentiment in a popular work, with the significant title "Democritus Reviving."

Thenceforward several more scientific departures may be traced. The first was simply that of connecting the mind with sense. Peter Gassendi, whose "Philosophical System of Epicurus" has distinguished him as the father of modern materialism, and whose playful invocation to Descartes, "O Spirit!" provoked the stinging retort, "O Matter!" had emphasized the Epicurean conceit that ideas are the mental images of material objects, derived through the senses. Hobbes, issuing his book in time for it to receive a dying kiss of approval from Gassendi, described such ideas or images as directly impressed upon the brain, and there decaying and reviving, according to their relative intensity. Locke, agreeing with Gassendi rather than with Hobbes, added reflection to sensation as a source of ideas, but in opposition to the Cartesian definition of mind, suggested that matter itself might not be incapable of thought or of reflection as well as sensation. The English free-thinkers generally, such as Layton, Coward and Collins, eagerly seized upon this crude conjecture, and strangely enough were joined by some clerical recruits, such as Dodwell, Bold and Perronet, in the supposed interest of orthodoxy. The Abbé Condillac, a French admirer of Locke, in his celebrated treatise on "Sensation," at length proceeded to resolve reflection itself into sensation, or to transform all ideas into sensations, illustrating the process by an imaginary human being, encased in marble and allowed successively to acquire the different senses and combine the corresponding ideas by acts of attention, memory and judgment.

The next step was that of merging the mind in the brain. Hartley, who had been studying Hobbes and Newton as well as Locke, with the method of a physician, in his "Observations on Man," represented the white medullary substance of the brain and nervous system as the instrument of sensation, ever vibrating, like an exquisite harp, to external impressions under the laws of association, and thus originating all our simple and complex ideas. Charles Bonnet, a Swiss physician, somewhat more crudely than Hartley, described the mind, in his "Essay on Psychology," as operating only through cer-

tain elastic fibres of the brain, to which all ideas are attached, and whose structure and movements should, therefore, form the first subjects of mental science. George Prochaska, a distinguished German physician, at the close of the last century, enunciated a growing opinion that different parts of the brain have different mental functions, which admit of direct physiological investigation. Dr. Gall, combining this theory with the physiognomical principles of Lavater, then argued, in his work on "The Functions of the Brain," that the compacted organs growing within the skull, determine its exterior size and shape, and may be found expressed on its surface, where, with the aid of Dr. Spurzheim, he mapped as many as thirty mental faculties. Cabanis, the physician of Mirabeau, emerging from the French revolution, with his "Treatise on the Physical and Moral Constitutions," boldly declared the nerves to be the whole man, and reduced all sensation and reflection to the action and re-action of the brain, which he vaguely likened to a gland secreting thought, as the liver secretes bile or the stomach digests food. Count de Tracy, author of the famous "Ideology" or Doctrine of Ideas, proceeding on the physiological principles of Cabanis, after the manner of Condillac, analyzed all our cognitions, feelings and volitions into mere forms of nervous sensibility and cerebral action.

The final step has been that of reducing the mind to a physical force. Dubois Reymond, of Berlin, having shown the analogy and connection between the nervous force and electricity, likened the brain to a voltaic battery, receiving and discharging currents of sensation and volition as a miniature telegraph. Dr. Maudsley, in his acute treatise on the "Physiology and Pathology of Mind," has defined the mind scientifically as an exalted natural force, developed from the inferior chemical and vital forces of the body and concentrated in the brain, through which organ thought is evolved, memory organized, and the will conserved as the momentum of personal energy. Professor Barker of Pennsylvania University, in his "Correlation of Vital and Physical Forces," bridging the chasm at which Maudsley pauses, has argued that reason, intelligence, emotion, in short, thought-force, like muscle force, comes from the food, which is itself but potential heat

and motion, and may be expended again as muscle force in the physical efforts of speech and gesture, and possibly measured by the foot or the pound. Professor Huxley, as if to illustrate such views practically, whilst delivering his well-known lecture on the "Physical Basis of Life," imagined himself clad in the "Peau de Chagrin" of Balzac, a magical wild ass's skin, which caused the wearer to shrink toward nothingness with every gratified wish, and explained how he proposed, after that literary effort, to transubstantiate sheep into man, or mutton into thought, unless perchance, being shipwrecked on his homeward journey, he should prematurely relapse to lobster. It will be observed that the materialistic movement, at its extreme, aims to convert all mind into mere matter.

As to the second problem, the conduct of the will, there arose also two rival schools, the necessitarians and libertarians. According to the former, the soul is a mere necessary agent. It had been the orthodox teaching from Augustine to Aquinas, that the will of man acts under the predestination of God, and by the fall has lost all power to do good; and this dogma passed into all the earlier psychological speculations at the Reformation. Luther, in his controversy with Erasmus, wrote a treatise on "The Slavery of the Will," maintaining its total moral disability or loss of liberty in spiritual things, and likening its passive agency to a saw in the hands of a carpenter. Calvin discussed the subject learnedly against the sophists of the Sorbonne, as he termed his antagonists, describing the will as naturally determined by the understanding, and therefore diseased, fettered and necessarily evil as God is necessarily good. Melancthon, recasting the Aristotelian ethics, made the will of God as expressing His wisdom and justice the supreme law of morals; described free agency as part of that divine image which has been lost though not annihilated; and represented natural causes, even the stars, as operating necessarily upon human affairs, except when divinely interrupted. And Cornelius Jansen, whose "Augustinus" was condemned by the pope, re-constructed that school of predestinarian ethics from which Pascal assailed the casuistry of the Jesuits.

But gradually several more scientific forms of determinism

appeared. It was at first attempted to link the will with divine impulse. Descartes, basing his whole psychology upon theism, had represented body and soul as two diverse substances, mechanically co-operating in perception and volition, with the concurrence or assistance of God, rendered in some incomprehensible manner. Louis de La Forge, physician at Saumur, an ardent disciple of Descartes, in a "Treatise on the Human Spirit," then explained by the theory of occasional causes how the will of God is the real cause, and body and soul the occasional or exciting causes of their correspondent ideas and sensations, their reciprocal volitions and motions. Pierre Silvain Regis, a still more enthusiastic expositor of Descartes, in his "System of Philosophy," substituted for the theory of occasional causes that of second causes, according to which the will of God as the efficient First Cause is ever exerted through body and soul, as second causes acting and re-acting with their senses and ideas, like two puppets moved by a concealed operator. Spinoza, dissatisfied with such explanations, boldly rejected the Cartesian dualism of body and soul, matter and mind, and merged them both in Deity as the one absolute substance of which they are but modifications, the sole universal agent of which they are instruments. Leibnitz, in order to mediate between Descartes and Spinoza, then imagined an infinite series of active substances or monads issuing from the great First Substance or Monad, with pre-established harmony of mind and matter, body and soul, like that of two perfect watches so adjusted as to keep time together; or a machine servant and master, so contrived as to work with each other. And these speculations as pursued by Geulincx, Wolff, and Bonnet, would have reduced man to a mere spiritual automaton impelled by divine power.

It was next attempted to chain the will to necessary motives. Hobbes, in a "Letter upon Liberty and Necessity," had defined volition, the last excited appetite, and represented the will, in its fancied freedom, no more self-determined than a wooden top spinning hither and thither, without knowing what has lashed it into motion. Locke, agreeing virtually with Hobbes, in his chapter "On Power," held the will to be self-determined only so far as moved by uneasiness or desire,

being continually driven toward good and evil in spite of itself, as when one is forced into agreeable company, or dragged down with a falling bridge. Anthony Collins, whose celebrated "Philosophical Inquiry into Human Liberty" marked the crisis of the controversy, then defended the moral necessity of the will or its determination by the reason and senses, as the only theory consistent with our experience, with the law of causality, with the dignity of a rational agent, with the divine foreknowledge, with rewards and punishments and with true morality. Jonathan Edwards, reasoning as a philosopher as well as divine, with his masterly "Inquiry into the Freedom of the Will," then assailed successively the theories of self-determination, of indifference, and of contingency, as involving endless contradictions, as destructive of the rational and moral faculties, and as tending to universal uncertainty and confusion. And soon these speculations were pushed to the most opposite conclusions, in one direction by the French fatalists, such as Diderot, La Mettrie, and D'Holbach; in another, by the English materialists, Priestley, Belsham and Godwin; and in another, by the American predestinarians, such as Dwight, Hopkins, and Emmons.

But at length, as the final step in this direction, it was attempted to bind the will in mental laws. Hartley, restating principles derived by Hobbes from Aristotle, had represented all reasoning and affection, all logic and ethics, as the mere result of association, a mental process of combining the nervous vibrations, or ideas and feelings, into judgments and habits, under fixed laws by which the will is necessarily determined in its action. Erasmus Darwin, advancing beyond Hartley in a materialistic direction, subordinated both sensation and volition to the laws of association, and enchained the will in acquired habits or catenated trains of nervous and muscular motions. James Mill, advancing beyond Hartley in a spiritualistic direction, with his "Analysis of the Phenomena of the Human Mind," not only traced the laws by which ideas associate themselves in clusters and series, but defined the will itself as nothing more than the power of certain interesting ideas, among them the complex idea of self, which, when decomposed, will vanish into an unknown quantity, afterwards

termed by his son, John Stuart Mill, a mere series of feelings, or possibilities of feeling. The later Scottish associationalists generally, however, such as Stewart, Brown, and Mackintosh, have taken a conservative position, involving the will in mental laws, but allowing it a special control of those laws. The recent German associationalists, such as Herbart, Beneke, and Lotze, pursuing the path opened by the elder Mill, have pressed mental laws to the extreme of obliterating all original distinct faculties, by variously asserting the will itself as an effort determined by the strongest masses of ideas, a balancing of psychical forces and products, and a resultant movement of combined monads or ideas. The latest English associationalists, such as Lewes, Bain, Maudsley, and Spencer, pursuing the path opened by the elder Darwin, have brought mental laws under the more general physical laws of correlation, conservation, and evolution, by tracing the growth of will out of nervous force into a collective impulse; the transmission of a pre-determining organization with cumulative power from generation to generation; the secular development of human out of animal forms; the spontaneous generation of life upon our globe, and the origin of the globe itself in a primitive nebula; and have thus justified the bold assertion of Huxley that thought, memory, reason, conscience, all our art, philosophy and religion once lay latent in a fiery cloud. At the necessitarian extreme, the will would appear to be little more than a developed force.

According to the libertarians, however, man is a free moral agent. And the opinion has been defended against its opposite from the earliest times. It had been held successively by Epicurus, by Pelagius, and by Duns Scotus, that the will is independent both of causes and ideas, that it is a God-given faculty of choosing between good and evil with the aid of the Holy Spirit; and that it is superior to the understanding, under the authority of the Church. And these tenets at the Reformation were re-affirmed in controversies, partly dogmatic, and partly philosophical. Erasmus, as the antagonist of Luther, wrote his treatise on "The Freedom of the Will," illustrating a frequent alliance of that theory with classic taste and culture. Bellarmin, in his Disputations, defined the will

a power of choosing or resolving, and represented the divine predestination as guided by a foreknowledge of human freedom. Arminius, remonstrating against the Dutch predestinarians, pronounced the free will a secondary cause of salvation, when it co-operates with the divine grace which has excited it. Socinus, in his Theological Prelections, rejected predestination altogether, leaving the will, even though weakened by its own sins, still free to accept or reject divine aid. And Loyola, for the defence of the hierarchy, had already organized that school of libertarian casuistry by which the will was practically as well as theoretically absolved from the claims of morality.

But by degrees the growing spirit of indeterminism assumed more scientific guises. The first effort was to free the will from divine constraint. Henry More, the first of the Cambridge Platonists or Latitudinarians, in his "Ethical Manual," after grouping the passions as useful instruments of reason, defended the freedom of the will against predestination, as the essential condition of morality. Cudworth, the learned chief of the school, projected a comprehensive argument against the material fatalists, who suppose a universe of mere matter and motion; the immoral fatalists who imagine a God decreeing the evil as well as the good in us; and the moral fatalists who assert morality in God but necessity in us to do good or evil without freedom and responsibility; these several antagonists being successively opposed, the first with his "Intellectual System of the Universe," or theory of unconscious mind in nature; the second, with his "Eternal and Immutable Morality," or doctrine of an essential goodness in the very nature of things rather than in the mere will of God; and the third, with his "Treatise on Free Will," or the spontaneous liberty of moral agents. Lange, Rudiger, and Crusius, together with a numerous body of German Theologians, vigorously assailed the pre-established harmonism of Leibnitz and Wolff, as incompatible with strict theism, with free agency and with moral distinctions. And indeed the whole school of predestinarian ethics was attacked with philosophical weapons from the most opposite points, by the Jesuitical casuists, such as Suarez, Escobar, and Gonzalez, by the latitudinarian

churchmen, such as Whichcote, Tillotson, Stillingfleet, and by the libertine courtiers, such as Bolingbroke, Rochefoucauld, and Mandeville.

The next effort in this direction was to free the will from necessary motives. Cudworth had already written his brief posthumous, Treatise on Free Will against Hobbes, distinguishing moral agents from mere machines or animals, as alone capable of self-determination, of praise and blame, and divine rewards and punishments.• Samuel Clarke, who opposed the automatism of Leibnitz as well as Collins, in his "Remarks upon the Philosophical Inquiry concerning Human Liberty," then maintained that free will is self-motion, or the proper action of the soul; that motives or judgments next preceding its action are distinguishable from the action itself; that such motives and judgments if merely acting upon it without its acting for itself, would reduce man to a passive machine; and that he differs from the brutes, whose action is but spontaneous, by being able to act freely and with a sense of right and wrong. Richard Price, discussing the "Doctrine of Philosophical Necessity" with Priestley, maintained that even animals possess liberty or self-motion; that such liberty is not only itself possible but a matter of our consciousness; and that it may even include motives considered as the occasions or ends of our acting, and not absurdly imagined to be the physical or efficient causes of action. Thomas Reid, with more subtle analysis, in his "Essays on the Active Powers of Man," having defined free will as activity or a power of causing effects, and having defended it as a mental fact intuitively discerned, implied in moral responsibility, and essential to all deliberate plans and actions, then assailed the opposite theory, maintaining that motives are mere influences and not efficient causes; that the best motives do not always influence us; that many trifling actions are done without motive; that some capricious and obstinate actions are done against motives; that the strongest motive only prevails through the will and not against it; and that uniform conduct is as consistent with liberty as with necessity. Henry Tappan, advancing beyond Clarke and Reid, in his "Review of Edwards' Inquiry," at length defined the will a conscious self-moving

power, indifferent to all motives, capable of obeying either reason or passion, or both together, or neither, with the prerogative in any case of a contrary choice. And these opinions were maintained, more or less philosophically, in England by Whitby, Taylor and Turnbull, in Scotland by Stewart, Brown and Mackintosh, and in America by Taylor, Beecher and Finney, Bledsoe, Whedon and Hazard. But the final effort has been to free the will from mental laws. Kant, in his "Critique of the Practical Reason," had asserted the absolute freedom of the moral will in the whole transcendental region; representing it as a law unto itself, superior even to the laws of thought, which logically exclude as problematical what it ever affirms as real respecting God, the soul and the world. Fichte, recoiling from Spinoza beyond Kant, in his "System of Ethics according to the Doctrine of Science," besides referring all intelligence to our own spontaneous activity, exalted free-will over the very laws of morality as a self-poised power, determining rights and duties by its mere rational volition. Coleridge, recoiling from Hartley beyond Kant, in his "Aids to Reflection," not only ranked the speculative reason and will, above all physical laws, in contrast with the inertia of the mineral, the sensitiveness of the plant and the spontaneity of the animal, but enthroned it as a spiritual power in a realm of pure spirit, originating its own acts, without the need of motives or stimulants. The later French libertarians, such as Maine de Biran, Cousin and Jouffroy, pursuing the spiritualistic path indicated by Fichte, have pressed free-will toward absolute control of all mental laws by variously describing it as the spiritual cause of thought and action, the essence of self and personality, and the source of moral worth and perfection. And the recent German volitionalists, such as Schopenhauer, Frauenstädt and Hartmann, following the realistic path from Kant, have been inclined to subordinate all physical as well as mental laws to mere will power, by tracing its gradual rise and intensification from the blind primordial energy, through the successive mechanical, chemical and vital forces, through the unconscious instincts, to a conscious volition, baffled by universal contradiction and suffering, and so have landed themselves in the dismal paradox that the world, as

we know it, had better not be, having originated in irrational volition and culminated in despairing reason. At the libertarian extreme, the will would thus appear to be scarcely less than a creative cause.

As to the remaining problem, the destiny of the soul, there arose the two schools of immortalists and mortalists. According to the former, the soul is naturally immortal. It had been repeated from Socrates to Cicero, through Augustine and Aquinas, with cumulative proofs, that the human spirit is indestructible by death or sin, or any other power, and must live eternally in woe or bliss. And this dogma, at the revival of learning and religion, prevailed over all other theories. Ficino restated it from the works of Plato; Agustus Niphus defended it against the Aristotelian speculations of Pomponatius; and at length the Council of the Lateran confirmed it as an article of faith, rather than a mere philosophical tenet. Protestant writers also agreed with Romanists in maintaining it as a strictly revealed truth with theological arguments; such as, that the divine eternity is a guarantee of the continued existence of the soul; that the divine wisdom would be frustrated if it did not fulfill the end of its being and the promise of its powers; that the divine goodness could not consent to the extinction of its noblest hopes and yearnings; that the divine justice requires its future punishment or compensation; and, in a word, that the divine glory would be better illustrated by its immortality than by its destruction.

But with psychological speculation came more scientific arguments. The first class was the ontological, derived from the essential nature of the soul. Descartes, claiming that the Council of the Lateran had authorized such philosophical reasonings, offered to prove to the Sorbonne, that the dogma of immortality could be deduced from his definition of the soul, as a spiritual essence, wholly distinct from the body, and not doomed to perish with it like the brutes, which are but machines, without souls. Leibnitz also assumed human immortality in his metaphysics, but without demonstrating it. George Frederick Meier, of the Leibnitzian school, in his "Proof that the Soul lives Eternally," besides inferring its survival after death from its spirituality and persistence, also argued on the

principles of the Monadology and Theodicea, that each finite spirit, by conceiving and reflecting the Divine Spirit, or absolute monad, participates in His eternal nature and becomes essential to His glory. Moses Mendelssohn, the hero of Lessing and Gœthe, in his "Phædon," combining Plato with Leibnitz, eloquently maintained the absolute simplicity, the invariable identity, and the metaphysical unity of the thinking monad, as well as its imperishable union with God as the crowning miracle and mirror of His whole creation. And similar arguments for the so-called natural immortality of the soul were urged, in numerous treatises, by the English spiritualists, such as Henry More, Norris, Whitby, Clarke, Collier and Baxter. Another class of proofs was the teleological, derived from the obvious design of the soul. Pascal had led the way to such reasoning with his terse logic, "If man is not made for God, why is he only happy in God?" Reimarus, more philosophically applying the Leibnitzian axiom of the sufficient reason, argued that the immortality of the rational soul is necessary in a natural economy containing nothing useless or aimless; that if its yearnings for knowledge and blessedness hereafter are not to be fulfilled, it is but a contradiction and failure worse than the beasts; that the present disproportion between its merits and rewards demands a future reparation; and that as nature finds its chief end in man, so man must find his chief end in God, the only worthy object and consummation of his best desires. Rousseau included among the few religious sentiments of his Savoyard Vicar the immortality of the soul as a deduction from its moral responsibility, in contrast with the distressing inequalities of the present social condition. Kant, consistently rejecting the arguments of Mendelssohn and favoring those of Reimarus and Rousseau, denied that the mere essential, identical and incorruptible nature of the soul can be proved, but simply claimed its future continuance as a postulate of the pure, practical reason, which requires infinite duration for the progressive coincidence of the will with the moral law. And similar arguments were advanced by the English moralists, such as Herbert, Shaftesbury and Morgan. A still remaining class of proofs was the analogical, derived from the general

analogy of nature. The disciples of Wolf and the earlier rationalists, in addition to the above reasonings, had argued analogically that as in nature there is no annihilation, but only perpetual renewal of life from death, of flowers from seeds, and of butterflies from worms, so man, by no more wondrous metamorphosis, may be born into a future state and find himself in new moral as well as physical relations to other worlds and their inhabitants. Bishop Butler, in his celebrated "Analogy of Religion and Nature," pursued the same argument with logical rigor, reasoning inductively from universal experience that living creatures pass through different forms and states without losing their identity; that we ourselves every seven, ten or twenty years shed the atoms and entire organism of our bodies, and sometimes even part with particular organs; that the mind, in its acts of reason, memory and affection, subsists independently of the body, and often in mortal diseases grows more vigorous as the body languishes; and that death itself, instead of being like a sleep, is rather like a second birth into a new social state as natural, as free from miracle or catastrophe, in the view of higher intelligences, as the cosmical system with which we are now acquainted. Swedenborg, however, with his doctrine of correspondences, carried such analogism to the utmost limit, by imagining that the soul at death only casts off the body as an outer rind or chrysalis, and immediately emerges into a spiritual world so like that which she has left, that she will be ashamed of her previous ignorance, and soon be able to find a congenial heaven or hell, which shall only reflect, with new combinations, such scenery and employments as are already known and familiar. To all these proofs has lately been added a novel class, derived from modern metaphysical and physical speculations. The theistic disciples of Hegel, such as Göschel, Weisse, and Fichte, have argued for the survival of the individual soul from its own indestructible rational essence, and from its participation in the development of the Absolute Reason. And some recent scientists, such as Rudolf Wagner, and Figuier, in his "Future Life according to Science" have sought to connect the spiritual substance with the universal ether which pervades all gross matter, surrounding the

earth with a stratum of etherial souls (the latest products of the terrestrial development) and concentrated in the sun as a mass of pure spirits, whose rays kindle all the germs of vegetable and animal life upon the planets.

According to the mortalists, however, the soul is essentially mortal. And the opinion, though not as prevalent as its opposite, has scarcely ever been without advocates. It had been held by Epicurus that the soul, being material, is resolved at death into its constituent atoms, and by Aristotle that through its implication with the body it becomes perishable; and some of the earlier fathers, Justin, Arnobius, and Lactantius, had taught that its immortality could not be proved by the Platonic arguments, but is only secured by divine grace. During the middle ages the controversy concerning it between the Thomists and Scotists turned upon the question whether it is a truth of revelation alone or also of reason. At the revival of letters in Italy, the two Aristotelian schools, the Averroists and the Alexandrists, agreed in denying individual immortality; the former maintaining that the universal mind of the race alone is immortal, and the latter identifying that mind with the divine mind or soul of the world. Pomponatius, the chief of the latter school, brought the controversy to a crisis with a treatise on the Immortality of the Soul, in which he argued that the particular intellect only reflects the universal in time and space, and under sensible images; that it must perish with the bodily organs through which it is exercised; and that true virtue is practiced without regard to an imaginary future self-interest. But after both Catholics and Protestants authoritatively defined the doctrine, such speculations disappeared, and only by degrees have returned in more or less scientific forms.

The first of these views was known as psychopannychism, or the total sleep of the soul. Christian sects in Germany and England, probably recoiling from the doctrine of purgatory, revived in a popular form the ancient opinion based upon the scriptural and classical analogy between death and sleep, that while the body rests in the grave the soul remains unconscious until awaked by the trump of the resurrection. Certain divines also, Heyn, Wettstein, and Reinhard, seem to have

held that the shock of dissolution produces unconsciousness, or leaves the soul in a state of depressed activity, like the languor of repose or a dreamless slumber. Priestley endeavored still more philosophically to identify the resurrection of the body as an awakening of the material soul from death, as his chosen epitaph still indicates. The materialists of the French revolution at length precipitated the logical consequences of the theory by proclaiming in their very cemeteries that death is an eternal sleep. And the most varied religious applications of it, as we shall see, have been made by different writers, such as Socinus, Bonnet, Olshausen, and Whately. A more pronounced form of mortalism was that of the soul's dissolution as a consequence of its materiality. Henry Taylor, in his "Search after Souls," and in various controversial essays against Bentley, Manlove, and Broughton, maintained the inseparable and extinguishable nature of the soul with materialistic arguments. Dr. William Coward entered the controversy with his "Second Thoughts concerning the Human Soul," designed to prove from its perishable substance that it must disappear with the body, and can only be immortalized by divine power. Anthony Collins subsequently took the same position, in his discussion with Samuel Clarke, as a philosophical tenet to be maintained on purely psychological grounds. And after such divines as Dodwell, Bold and Perronet had associated it with the most peculiar dogmas of the Church, it was driven to the very opposite extreme as a doctrine of eternal death, by such materialists as La Mettrie and D'Holbach. But the modern form of mortalism has been that of the soul's re-absorption in nature as a lost individuality or expended force. The pantheistic idealists, such as Blasche, Michelet, Rosencranz, hold to an immortality so-called, which is but a virtual extinction of human personality, by the supposed return at death of the finite ego or consciousness, into the infinite ego or consciousness; in other words, the annihilation of man in God. Dr. Alger, in his "Doctrine of the Future Life," examines the views of Drossbach and Widenmann, who maintain, that the human monad or individual soul ever survives and endures through death and all other changes, but with a loss of consciousness or of memory.

And the later German materialists, such as Feuerbach, Moleschott and Büchner, supposing that personality itself is but the product of organized atoms or forces, have reached the extreme of declaring that consciousness, mind and will, all are dissolved with those atoms and forces and forever lost in the circling powers of nature.

The empirical psychology, as now surveyed, presents to us a mass of conscious sensations, ideas, and emotions as the proper material of the special sciences of logic, æsthetic and ethic, together with certain rival hypotheses as to the origin, the conduct and the destiny of the soul or individual principle. But these hypotheses, besides being themselves in dispute, are already espoused by religionists as well as scientists, the most orthodox no less than the most infidel, and therefore as yet are too unsettled to be brought into adjustment with the corresponding dogmas of the science.

In the revealed section of psychology, also, may be traced like stages of divergence from the rational theory of the soul. In the first stage there was a speedy disappearance of the false scientific psychology of the mediæval schools. It was the time when the cumbrous logic and metaphysics, which had become entangled with the whole system of divinity, were falling under the blows of the Reformation, and the great divines of the age, with rare acuteness, were exploring anew the psychological foundations of all the peculiar doctrines of grace. Luther, in his usual vehement tone, denounced Aristotle as that actor who, with his Greek mask, had been so long playing on the stage of the Church, and declared it his greatest cross to be forced to see fine minds, intended for all good studies, spending their lives in such pursuits. Melancthon, though he retained somewhat of the system of Aristotle, carefully subordinated it to revelation, and wrote a "Treatise on the Soul," expressly designed to free the science from scholastic conceits. Turrettin, in his Institutes, studiously distinguished the question of free-will as it should be discussed in Christian schools, without the conceits of the Greek and Latin fathers. At the same time, other theologians, of more scientific tastes, were seeking to conserve all that was still true in the old psychology, together with the new. Father Gassen-

di led the way for Priestley in speculations, which may yet appear as the crude beginnings of a sound Christian materialism. Father Malebranche agreed with Berkeley in maintaining that true spiritualism which underlies the whole biblical psychology. Bishop Butler, in his Sermons on Human Nature and Dissertation on Virtue, not only pressed the ethics of Shaftesbury into the service of religion, but laid the ample foundations of man's responsibility, with equal firmness, in the theories of prudence, of benevolence and of rectitude. At length Jonathan Edwards, by his masterly treatise on the Freedom of the Will, cleared away the rubbish of all former speculations upon that long-vexed question, and revealed a scientific basis for the most trying paradoxes of the Christian Faith. And since then many other thoughtful divines, such as Reid, Stewart and Chalmers, Tappan, Whedon and Hodge, and Wuttke, Delitzsch and Ulrici, have been vigorously re-constructing the whole Scripture doctrine of the soul in its true relations to the body.

All this time, however, the great mass of modern theologians have adhered to the traditional dogmas concerning the creation, regeneration and glorification of the human spirit, with little or no care for any scientific inquiries into its origin, conduct and destiny. As to the first of these dogmas, it was still generally maintained that the soul, as a separate substance, is not generated by the parents, but immediately created by God. Justin Martyr and Origen had, indeed, favored a Platonic view of the pre-existence of the soul, referring its miseries in the present body to its sins in a former state; and Tertullian and Gregory of Nyssa had gone to the other extreme of traducianism, or the notion of a physical propagation of the soul from parent to child, as more consistent with the doctrine of original depravity. But at length throughout both the Greek and Latin Churches traducianism had been supplanted by creationism, as the only orthodox opinion. Lactantius, borrowing the sentiment from Lucretius, that we are all the celestial offspring of the same Father, declared that only mortals could be generated by mortals, and cited against traducianism the intellectual prodigies born of stupid parents. St. Jerome went so far as to describe the birth of any human

being as an incarnation, wanting only the special miracles of the nativity of Christ. Augustine, while refraining from speculations upon the origin of the soul, maintained its distinct creation in Adam, if not in each of his descendants. The scholastic divines, still more precisely, defined creationism against traducianism. Thomas Aquinas, though granting that the so-called sensitive soul might be physically derived in the likeness of the parent, maintained that the intellectual or rational soul could only be created directly in the image of God. Hugh of St. Victor declared it to be the Catholic faith that the souls associated with living bodies had been made of nothing, rather than propagated in a carnal manner. And Peter Lombard unequivocally maintained that all souls since Adam were created in the body by direct infusion of God. At the Reformation the Lutheran divines reverted to traducianism, while the Reformed theologians, with the Roman doctors, re-affirmed creationism. Luther, Gerhard and Hollazius held that the souls of those descended from Adam and Eve had neither been created nor generated, but propagated with a moral taint of original sin. But Calvin, Beza and Turrettin, as creationists, maintained that there could have been no moral contagion in mere flesh or in mere spirit, the guilt of Adam having been imputed to his posterity by just ordinance of God. At the same time, both classes were inclined to treat the mode of the production of the soul, whether by creation or by propagation, as an inscrutable mystery, upon which the existing psychology and physiology had not yet begun to shed any light.

As to the dogma of regeneration, it was still generally held that the soul is born again and renewed by a supernatural act of the Holy Spirit. The early Church Fathers had, indeed, sometimes understood by regeneration the mere baptism of a proselyte from the Jewish or Pagan faith, and always strictly insisted upon the freedom of the will, even in the moral renovation which the term now implies. St. Clement, not only attached a mysterious grace to baptism, but declared that for man to strive for holiness beyond his own power, would be as absurd as to expect a horse to plough or an ox to serve for riding. Origen, though he saw a more symbolical meaning in

baptism, held to no such regeneration as would obliterate the free-will and make God the judge of natural faculties rather than of voluntary actions. Tertullian, too, attributed the most extraordinary virtues to the baptismal water, as both a natural and Scriptural emblem, while he denounced any doctrine of moral inability which would leave man, the destined lord of creation, such a slave that he could not reign over himself. But after these opinions had been pushed to their logical extreme by Gregory and by Pelagius, the orthodox faith was defined by Augustine, who taught that the regenerative grace communicated in baptism effaces the stain of original sin, liberates the enslaved will and quickens into new life all the powers of the soul. The scholastics then refined upon the doctrine with endless subtlety. St. Thomas Aquinas and Peter Lombard held not only that the baptismal grace regenerates the soul in both infants and adults, but also that it secures the pardon of past sins, with power thereafter to perform virtuous actions. The mystics, Bonaventura and Tauler, glowingly depicted the new life of the regenerate soul, through its degrees of purification, enlightenment, perfection and final absorption in Deity. And gradually, as the practical fruit of such opinions, there grew up the notion of supererogatory works of merit, the sale of indulgences and other abuses which led to the Reformation. But since that time, the mass of Protestant authorities, with the exception of Anglican divines, have distinguished regeneration from baptism and re-defined it as a spiritual, though supernatural renovation, having no invariable connection with that sacrament. The early Lutheran and Calvinistic theologians, indeed, seem to have made it almost synonymous with conversion, and included in it even the external divine acts of the justification, adoption and sanctification of the soul, together with their effects, as expressed in faith, repentance and good works; in a word, the whole process of restoring the divine image in man. Later divines, however, became more discriminating and precise. The Lutheran symbols described regeneration as a renewal of heart, mind and will, in which the soul is as passively subject to the operation of the Holy Spirit as a dead man before he is quickened into life, though it may afterwards co-operate with that

Divine agent in all gracious works. The Westminster Standards still more explicitly taught that the mind is enlightened, the will determined and the whole heart changed, not by mere moral suasion, as through the influence of truth, but by Almighty power or irresistible grace. At the same time, orthodox divines were agreed that this new-birth changes neither the substance nor the faculties of the soul, but is simply to be treated as an inscrutable mystery, which no psychological science could gainsay or explain.

As to the dogma of the resurrection, it was universally held that the perfected soul, after the separate state, will be reunited to its glorified body. The Church fathers had taught a literal resurrection of the same flesh. Origen, Basil and Gregory of Nazianzum had, indeed, explained the immortality of the disembodied soul and magnified the difference between the body celestial and the body terrestrial, likening the latter to the goat-skins with which our first parents clad themselves after their fall. But Justin Martyr argued that the same corporeal members, including the most carnal, having been made instruments of sin or of righteousness, must participate in the future rewards and punishments, and that even cripples could only be miraculously restored in the resurrection, like the man with the withered hand in the Gospel. Tertullian so far identified the body with the soul as an essential part of the divine image, that he anticipated for its several organs higher spiritual uses, as the mouth now serves not only for eating, but for praising God. St. Jerome still more grossly described the resurrection body as composed of blood, tissues, bones, all the present organs, even the teeth, which the condemned shall gnash, and the very hairs, which are all numbered. At length Augustine defined the doctrine against both extremes of the Greek and Latin fathers by consigning the soul to a separate state of purification, termed purgatory, and reserving for it a future body, substantially like the present, but free from its defects, impurities and distinctions of age, sex and stature. The scholastic doctors proceeded to indulge in the most fantastic speculations upon these opinions. Thomas Aquinas taught that wicked souls in purgatory suffered from literal fire; while the righteous passed immediately into beatific rest

until they should receive new bodies, derived only from the substance possessed at death, in the prime of their vigor, with refined senses and organs, swift in movement and glorious in aspect, but invisible to mortal eyes. Peter Lombard, though refraining from such subtleties, distinctly enunciated the dogma that the prayers and alms of the faithful avail for the release of souls from purgatory, and even that in this matter the rich have advantages over the poor. Gregory the Great, upon this doctrinal basis, at length organized the tremendous system of masses and penances, by which the Church enforced its claim to hold the keys of heaven and hell. The most saintly mystics, such as Bonaventura and Hugh St. Victor, brooded in devout reverie over the raptures of paradise and the torments of purgatory; the great poets and artists, such as Dante and Michael Angelo, depicted them in vivid imagery; and all Christendom trembled in view of them, as ever on the brink of unspeakable bliss or woe. With the downfall of these superstitions came the Protestant attempts to reconstruct the true doctrine of immortality and the resurrection. The Lutheran formulas did not at first distinguish between the happiness of the soul in the separate state, and the more complete happiness it attains through the resurrection of the body, but simply taught that at the coming of Christ in judgment, all the dead shall be revived, the pious elect receiving eternal life and joy, while impious men and devils are condemned to everlasting torment. The Church of England, in her beautiful liturgy, speaks of the departed spirits of the just as delivered from their earthly prisons, freed from the burden of the flesh, and ever dwelling with God in perpetual joy and felicity, until in the general resurrection they shall receive again their bodies, made pure and incorruptible. Jeremy Taylor and some later divines described the intermediate state as a Paradise, distinct from the heaven of the blessed, and a receptacle of holy souls, made illustrious with the visitation of angels. The Westminster standards, more dogmatically but not less poetically, declared that the souls of believers are, at their death, made perfect in holiness and do immediately pass into glory, while their bodies, being still united to Christ, do rest in their graves until the resurrection. But all orthodox di-

vines alike refrained from precise definitions of the resurrection body, more especially as the existing physiology had shown no power of elucidating such future mysteries.

SECTION V.

Sociology, Rational and Revealed.

In the rational section of sociology we may trace three stages of departure from the revealed doctrine of society. In the first and legitimate stage occurred the great political revolt from a false theocracy, from the pretended Vicar of Christ at Rome. It was the critical epoch when the State was asserting its independence of the Church, and everywhere far-seeing patriots and philanthropists were opening the paths of freedom and progress. As early as the twelfth century, Arnold of Brescia, the pupil of Abelard and proto-martyr of civil liberty, had perished in the vain attempt to create at the capitol of Christendom an ideal republic, which should sequestrate the wealth of the Church for the good of the people. Sir Thomas More, three centuries afterward, an advocate of tolerance, liberty and equality, while despotism still reigned throughout Europe, had dreamed of his "Utopia," the first of those new Platonic commonwealths which sanguine spirits, like Campanella and Harrington, have ever since been projecting as the brilliant goal of the social development. John Bodin, whose "Republic" was a marvel of his age, had traversed nearly the whole range of political science, and even anticipated Montesquieu in connecting civil history with geography by referring national character and institutions to the influence of race and climate. Montesquieu himself, in his great work "The Spirit of Laws," for the first time traced the rationale of all governments, institutions and customs with that nice historical dissection which was afterwards so happily described by Guizot and De Tocqueville as a species of political anatomy. Victoria, Ayala and Gentilis, as professors of ecclesiastical, military and civil law, had collected those precedents and problems of public ethics which were yet to be more philosophically treated. Hugo Grotius of Holland, the founder of international jurisprudence, in his renowned treatise "On the

Rights of Peace and War," then proceeded to lay the foundations of universal justice in reason and experience by citing the opinions of philosophers, historians, poets, orators, together with prophets and apostles, as in a grand Amphyctionic council of nations. John Baptist Vico of Florence, the father of the philosophy of history, as a disciple of Bacon and Grotius, announcing his "New Science of a Common Nature of Nations," exhibited for the first time, by an historical induction, the career of States as proceeding under periodic laws. Robert James Turgot, who began as prior of the Sorbonne and ended as minister of state at the summit of the Revolution, in his discourse on "The Successive Advances of the Human Mind," enriched historical science with those additional ideas of social progression and perfectibility, which were afterwards matured by Condorcet, Dove and Comte. Adam Smith, the father of political economy, gave the first check to legislative interference with the laws of trade, by drawing attention to labor as the source of opulence, and the power of capital in developing industry; while St. Simon and Fourier broached the first crude notion of a self-adjusting harmonism of social interests and passions. Gotthold Ephraim Lessing, ascending above the physical and intellectual into the religious sphere, by his suggestive treatise on "The Education of the Human Race," raised the high problem of the relation of revelation to social progress and culture, which the genius of Schlegel and Buchez has not yet solved. Meanwhile, too, were rising in England, France and Germany those schools of civil historiography, founded by Gibbon, De Thou and Schlözer, which have since been adorned by Hallam and Grote, Guizot and Thierry, Niebuhr and Mommsen, and which, though more erudite and literary than philosophical, were destined to serve as the museums or collections of materials for the students of a stricter historical and social science. At length Herder, the father of universal history, with rare catholic genius, combining all human interests, art, science, politics, religion, in his magnificent fragment, "Ideas toward a Philosophy of the History of Mankind," essayed to trace the entire development of the race, from its origin to its destiny, as one necessary march of law and reason. And ever since

then a host of historians, statesmen, economists, statisticians and philosophers, the mention of whom would crowd the page with brilliant names, has been engaged, more or less directly, upon the scientific study of human society as a complex organism, regulated by physical and psychical laws.

During all this time, however, in the second separative stage, arose various hypotheses, more or less scientific, concerning the origin, the progress and the destiny of civil society, of the State, treated as a social institute, distinct from the Church. As to the first of these problems, the origin of civil society, there were the two rival schools of legitimists and revolutionists. According to the former, civil government originates in divine right. It had been the express teaching of the early fathers, such as Justin, Polycarp, Chrysostom, that emperors and princes held their power from God, as His vicegerents, and were to be passively obeyed even when exercising that power as tyrannically as a Nero or a Diocletian, in persecuting the Christians. And this dogma, though overshadowed by the papal supremacy during the Middle Ages, was revived by various parties, Catholic, Protestant and Infidel, amid the social upheavals of the Reformation, and re-cast into the forms of a political theory. By one party, from religious rather than political motives, the divine right of civil rulers was derived mediately from the people as a sacred trust. Cardinal Bellarmin, in his great work on "The Supremacy of the Sovereign Pontiff over Temporal Affairs," adopting the scholastic distinctions, maintained that popes alone received their authority directly from God, while civil rulers received theirs indirectly through the consent of their peoples, who were originally created with a capacity for monarchy, aristocracy or democracy, according to their circumstances and opinions. Francis Suarez, the Spanish Jesuit, published a "Defence of the Faith against the Anglican Sect and the most serene king James," in which he also argued the indirect origin of civil as distinguished from ecclesiastical power, and even asserted the paramount right of the Roman Pontiff to depose and execute heretical princes, with the consequent right of their subjects to resist them by force. Father Mariana, another famous Jesuit, in a work "On the Regal Institution,"

through his zeal for the papacy against royalty, astutely distinguished between a king and a tyrant, and went so far as to justify tyrannicide or political assassination as an original right of the persecuted citizen. And to the same party belonged those Protestant writers who accepted monarchy or aristocracy as a divine institution, subordinate to the Church.

By another, bolder party, the divine right of civil rulers was derived immediately from Heaven as a direct commission. Bossuet, in his "Defence of the Gallican Church," held the French sovereign, in his temporal capacity, to be absolutely independent both of the pope and of the people, and stigmatized papal interference as usurpation and popular rebellion as mortal sin, oppressed Christians being but as sheep in the power of wolves. King Louis XIV., claiming such divine right as his own, afterwards but expressed the theory of his courtiers in the proud assertion, "I am the State." James I. of England, whose pedantic "Defence of Kings" was aimed at Bellarmin and provoked the reply of Suarez, told his Parliament that the privileges of legislatures were pure concessions from the bounty of monarchs. And with such parties, from opposite motives, agreed the French skeptics Montaigne, Charron and Bayle, and the English divines Taylor, Heylin and Usher.

At length, by another still more extreme party, the divine right of kings was derived from the family constitution, with a religious consecration. Bossuet had adduced such an argument from the very word "Abimelech," or father-king, as the title common to the Hebrew monarchs. The early English reformers inculcated submission to kings, as included in the decalogue under the command to obey parents, and later "Homilies" of the Church consigned political rebels to eternal perdition with Satan, leader of the first great rebellion. Sir Robert Filmer, whose "Patriarcha" became the manual of the school, maintained that all government was originally monarchical, being derived from the heads of families by primogeniture, or by delegation on failure of succession, and that a mixed or limited monarchy was unlawful, even unnatural, and could only issue in anarchy. The "Icon Basilike, or Portraiture of his Sacred Majesty in his Solitude and Suf-

ferings," attributed to king Charles himself, and pathetically said to have been written not with a pen, but a sceptre, caused that monarch to be all but adored as a royal martyr, whose death had been an unnatural crime, equivalent to parricide. Such extravagant notions of divine right may seem to have long since disappeared with the decline of absolute monarchy; but in our own day they have been revived in an aristocratic and theocratic form by those defenders of American slavery and polygamy, who have justified such institutions from the Scriptures, and even in a democratic form by zealous unionists, who sought to define secession dogmatically as a sin. It has thus ever been the tendency of extreme legitimism to clothe civil institutions with divine sanctions and prerogatives.

According to the revolutionists, however, civil society originated in a social contract. It had been the opinion of ancient philosophers, such as Plato, Cicero, and Seneca, that the first men in a wild state entered into government by mutual consent for the common welfare; and this speculation, after having been long displaced by the patristic doctrine of passive obedience, was partially revived by the schoolmen and later doctors, under Aquinas and John St. Mary, in the distinction between mediate and immediate divine right, and at length, amid the political revolutions following the Reformation, moulded by different classes of publicists into a scientific hypothesis. At the outset there was a class, who from political rather than religious motives, assailed the figment of immediate divine right. William Barclay, a Scottish professor of civil law in France, whose treatise on "The Power of the Pope in respect to Kings and Princes" drew an answer from Bellarmin, and a defence from the Parliament of Paris, was the first Catholic layman to resist that papal claim of supremacy and arbitration, which convulsed the kingdoms of Europe until the peace of Westphalia. George Buchanan, jurist, poet and historian, as famous for applying the birch to his young pupil, king James, as for his subsequent treatise against the "Rights of Royalty," issued the slogan which was echoed and re-echoed through the British Islands, until their settlement in a constitutional monarchy under William of

Nassau. Milton, by order of Parliament, produced "Iconoclastes," or Image-breaker, as an offset to Icon Basilike, and at the same time defended the people of England against Salmasius, the champion of the royalists on the continent. Algernon Sidney, with his ponderous "Discourses on Government," demolished the last remnants of that patriarchal theory which for generations had invested absolute monarchy with the charms of romance, as well as the sanctions of nature and of religion.

Then followed a class of speculative publicists, who instead of the right divine, held to an original compact between ruler and people. Grotius, Puffendorf, Cumberland, and numerous other writers, had already referred political institutions and laws to the natural sociableness of mankind, and Hooker and Selden had even based the authority of kings upon the consent of their subjects, though without drawing the logical consequences. John Locke, in his celebrated "Treatise on Government," after refuting Filmer on rational as well as scriptural grounds, then argued that all civil power was originally a pure concession of the people, and enunciated that principle of representative legislation, which, though it failed to take root immediately in the wilds of Carolina, was destined to dissolve and restate political compacts throughout America and Europe. Jefferson, Adams, and Hamilton, with their compatriots, only formulated and applied such opinions, when they declared it to be self-evident that all men are born free and equal, and proceeded to dissolve the political bands which connected them with the English monarchy, and to constitute a new government on the basis of the popular will alone.

But in the end, there appeared a class of revolutionists assailing the divine right of the family, of property, and of the whole social order. Machiavelli, Spinoza, and Hobbes had already represented all civil government as having originated in brute force, rather than right and reason. Morelli and Mably, French political writers in the eighteenth century, had included the passions and instincts as legitimate rights in the code of nature, insinuated doubts upon the existing moral order, and advocated Spartan and agrarian principles of legisla-

tion. Rousseau, the herald of the revolution, in his "Social Contract," among other reckless paradoxes, ridiculed all civil power as no more divine than the pistol of the highwayman, and described even representative government as an abridgment of natural liberty; indeed all civilization as but a complex usurpation of the original rights of man. Brissot of Warville, the incendiary of the reign of terror, applying the doctrines of Mably and La Mettrie in a violent pamphlet, proclaimed to the populace that marriage was mere slavery, property but robbery, and the savage the only legitimate state of society. And Mirabeau, Robespierre, St. Just and their accomplices in the Assembly simply precipitated the anarchy in which they were themselves overwhelmed, when they converted such doctrines into decrees issuing in general pillage, lust and bloodshed. In our own times somewhat similar opinions have been peacefully revived in a more scientific form by St. Simon, Fourier and Owen, and in a political form by Cabet, Louis Blanc and Proudhon.

At length, we find such revolutionary speculations coming to practical effect in every sphere of social activity. Communism hitherto, ever since its first ideal example at Pentecost, has been practiced peacefully within the bounds of law and order. The Roman Catholic communities of monks and nuns, and the Protestant communities of mystics and perfectionists, though based upon voluntary poverty, celibacy and expatriation, have not directly assailed the institutions of the family, the State, and the Church with which they co-existed. And even such infidel communities as menaced those institutions have been simply experimental and exemplary rather than lawless in their aims and efforts. But communism has been followed by socialism, which seeks openly to reconstruct or reorganize all society through legislation and other forms of political action. Mr. Henry George, though not an avowed socialist, would at least confiscate all land or rent for the sole benefit of the workingman. The German, French, and English socialists assail every kind of private property, landlordism, family hereditaments, Church endowments, and would ultimately make the State the sole heir and owner of all private estates with the view of redis-

tributing social classes in the interest of the producing or laboring class. At last, mere theoretical socialism is having its issue in anarchism, which strives to abolish all existing social institutions as a first step toward social reorganization. Industrial fraternities cannot be charged with such principles, although by the strike and the boycott they have sometimes brought war between social classes which were at peace, have seriously deranged trade and commerce, and even menaced the public peace and order. But anarchism pure and simple has been avowed by the French socialist, Proudhon; by the German social democrat, Carl Marx; by the Russian nihilist, Bakunin; and by their emissaries in America; while in the International Association of Labor it has the portentous bearing of a world-wide conspiracy against all civilization. In the end the revolutionary tendency would thus annihilate the State itself with every vestige of law, morality and religion.

As to the second problem, the growth or progress of civil society, there were also two rival schools, the libertarian and the necessitarian, or the pragmatic and the inductive historians. The former would refer all social events to mere will, divine or human. It had been the habit of ecclesiastical historians, from the days of Eusebius and Theodorus, to assume Providence as the chief agent in history and the Church as a special factor, to which all accompanying civilization was but tributary. And the early historiographers, accepting this as the only scientific treatment of social phenomena, simply exhibited civil history, in connection with ecclesiastical, as in a sort of divine drama or plan of Providence. Bossuet, in his eloquent "Discourse," depicted the rise and fall of Egypt, Assyria, Media, Persia, Greece and Rome as dependent upon the salient epochs of Jewish history and conspiring to the establishment of the Christian religion and the Catholic Church. Prideaux, in like manner, connected the History of the Jews with that of neighboring nations, from the time of the kings of Israel to the coming of Christ, leaving Shuckford and Russell to complete the connection of Sacred with Profane History, during the preceding periods from the time of the Creation. And the

same pragmatic, though devout spirit, has often been pushed, with questionable minuteness, into more recent history; as by Schomberg, whose "Theocratic Philosophy of English History" is but an attempt to explain the civil and military events of the State as so many special divine interpositions on behalf of the Church; and by the late Canon Kingsley, who represents the wars of the Teutons and Romans as managed by a General in Heaven, with the strategy of Providence.

By degrees, however, civil history was detached from ecclesiastical as a purely human drama or game of kings and statesmen. Dr. William Robertson, principal of Edinburgh University and leader of the moderate party in the Kirk, gave to the world Histories of Scotland, England and America, so secularized by romance and philosophy, so filled with ideal scenes and personages, that they appeared like stately dramas, and as such were in fact applauded by the great of his day. Hume, carrying the skepticism of his philosophy with him, wrote his partizan "History of England" with such entire suppression of the religious element that Alison, one of his most generous critics, declared it was like the play of Hamlet without the character of the Prince of Denmark. Gibbon, with still more ironical purpose, in his famous chapters on the rise and spread of Christianity, may be said to have completed the secularizing process by laboring to reduce that great miracle of history to a mere ordinary product of human causes and motives. And the same spirit, to an infidel extreme, displayed itself in the historical writings of Voltaire and Volney.

Another still stronger pragmatic tendency has been that of concentrating the significance of history in great men as the conspicuous figures in the Providential drama or the prime movers of civilization. Cousin, in his brilliant lectures on history, whilst admitting other social factors, exalts above them the series of warriors, statesmen, poets, artists, thinkers, as the exponents of whole nations and epochs, summing up humanity as humanity itself sums up nature, and swaying the world as divine instruments whose title is success, whose reward is glory. Carlyle has made the same doctrine popular in his "Heroes and Hero worship," and described the whole English Commonwealth as scarcely more than a Cromwelliad.

Emerson, in his essays on "Representative Men," with characteristic egoism, erects history into a sort of stage for the display of the Platos, the Shaksperes, the Napoleons, who have personified the different phases and epochs of humanity. And the biographical form, which so many popular histories assume, is a standing proof of the extent to which this pragmatic view of social phenomena prevails.

A more abstruse form of the same tendency, which has appeared in our day, is that of exhausting the import of history in certain great ideas or typical facts, and thus rendering it a mere vehicle of philosophy or supposed process of logic. The German idealists have proceeded on the principle that the science of history is not to be derived from history itself, but only illustrated by it as a theory of the world in all its possible epochs, which the philosopher has conceived independently of experience. According to Fichte, history is but the biography of the Absolute Ego from the infancy to the maturity of reason, through the five great epochs of instinct, authority, reflection, science and philosophy. According to Schelling, it is the self-evolution of the Absolute Mind, as revealed in humanity through the three periods of fate, of natural law, and of Providence. According to Hegel, who reduced history as well as nature to sheer logic, it is the human development of the Absolute Reason, the dialectic of nations, the great argument of successive civilizations, beginning in China, continuing in India, Egypt and Greece, and issuing in Germany as a complete triumph of art, religion and philosophy. Cousin, applying the Hegelian logic, found in all history, as the only possible phases of civilization, the three ideas and epochs of the infinite, the finite, and the relation between them, with their predetermining climates, the Asiatic, the Mediterranean and the European. The Italian positivist, Ferrari, in his "Essay on the Limits of the Philosophy of History," whilst advocating an ideal history to be generalized from actual history, denies that actual history yields the ideal histories of Hegel and Cousin, since they would arbitrarily ignore or modify whole nations, epochs, and civilizations, according to logical pre-conceptions, and thus exhaust all human development in mere Hegelianism, the conceit of a single philosopher.

At length the pragmatic tendency has come to an extreme in writers who have declared a social science impossible, and made it the very design of history to emancipate free will from fixed laws. Professor Froude, in his essay on "The Science of History," has maintained that historical phenomena never repeat themselves, that natural causes are ever liable to be set aside by volition, and that consequently there can be no scientific explanation of what men have done or will do, and no experimental investigation of social facts. Professor Goldwin Smith, in his lectures on "The Study of History," has argued that the supposed social laws are precluded by human free-will and divine justice, that neither climate nor race determines the destiny of nations, that the very language of the sociologists is mere delusive metaphor, and that there could be no inductive theory or science of history until history was itself finished. M. Michelet, a disciple and critic of Vico, in his little work entitled "Introduction to Universal History," has described human progress as a continuous battle of man with nature, of liberty with fatality, proceeding from the eastern to the western nations, involving the gradual enfranchisement of religion, of science, of industry, and destined to issue in the universal triumph of individual freedom; according to the fine saying of Hegel, "The ancient world knew that one man was free, the king; the modern world knows that some men are free, certain classes; but the coming world will know that all men are free." To the same class Professor Flint, in his "Philosophy of History," has assigned M. Quinet, a disciple and critic of Herder, who, against the fatalism of his master, has maintained that human history is not mere natural history, an advanced region of physical law and development, but is to be distinguished as the domain of free will, and that so far as it has any course or plan or aim, it simply exhibits the ceaseless struggles of the personal reason against the dominion of nature and the tyranny of society, from land to land and from age to age, in search of the goal of absolute freedom. And thus the pragmatic spirit in history would end by exalting mere individual will over all natural and social law.

But the necessitarian or inductive school of civil historians

have sought to refer all social events to fixed laws of recurrence and progression. The idea had very early been broached by Greek and Roman philosophers, such as Ocellus and Florus, that nations, like individuals, are born, grow and die, to be replaced by others, in the same endless circle; and some of the Church fathers, such as Epiphanius and Augustine, advanced the additional conception of a Providential march of the human race towards a perfect state of society. Hugh of St. Victor and Aquinas recognized a progressive revelation with successive dispensations. Buchez tells us that in the sixth century St. John Climaque spoke of a human progressiveness, and that St. Vincent de Lérins maintained a necessary increase in human knowledge, from age to age, to be consistent with the constancy of the Divine word. But it was not until the spread of inductive research in the sixteenth century, that different sets of social phenomena, one after another, began to be treated with anything like scientific method and were referred to invariable laws.

The first class of these inquiries related simply to the political or civil development of society. Machiavelli, in his "Discourse on Titus Livy," reproducing Plato's theory of circular revolutions, had maintained that ancient Rome was only recurring in modern Italy; and on the basis of this induction described all nations as at first choosing their kings, then combining against them under their nobles, at length revolting from their nobles, then again choosing kings for themselves, and thus ever running through the same phases of monarchy, aristocracy and democracy. Vico, with a more scientific spirit, in his "New Science," generalizing Roman history into an ideal history, exhibited an inevitable career of states through the successive forms of theocracy, aristocracy and democracy, under corresponding impulses of piety, honor and justice, as at first pursued in Pagan Rome, then repeated in Christian Rome, and to be repeated in all nations, with ever widening circles, until each shall have reached the purest possible form of a republic. Boulanger, by means of a work entitled "Antiquity Unveiled," found also in all history successively, theocracy, aristocracy, democracy; the age of gods, the age of heroes, the age of mere men; but crowned the series with

monarchy instead of republicanism, maintaining that mediæval Catholicism was the expiring effort of theocracy, and that Europe, having been first savage, then pagan, then Christian, had at length become reasonable under the existing monarchy. Boulainvilliers, as a noble of the old regime, placed aristocracy at the summit of these various revolutions. And numerous other civil historians, such as Ferguson, Guizot and Thierry, have represented all European nations as pursuing the same political career through the ever returning circle of aristocracy, monarchy, democracy, so that any one of them might be taken as a model of the others.

Another class of inquiries included the physical as well as the political development of society. Bodin, the first to base political upon physical geography, divided nations into northern, southern and middle, attributing to the first the climatic qualities of physical strength and courage, to the second those of intellectual power and culture, and to the third more or less of both, according to their latitude in the temperate zone. Montesquieu, in his celebrated work, the "Spirit of Laws," treating man as a sort of political plant, moulded by climate and legislation, mapped the whole earth with its coexisting monarchies, aristocracies and democracies, as so many indigenous products of different continents and countries. C. A. Walckenaer, who wrote under the first French Republic an "Essay on the History of the Human Species," treating man as but the most perfect of the animal races, described him as impelled by his passions through six successive stages, the barbaric, the nomadic, the pastoral, the agricultural, the industrial, the decadent, from gross animality up to the highest material civilization, and back again to mere animality. The Abbé Frère, at a later period, in his "Principles of the Philosophy of History," taking the bodily development as a type of the social, divided the natural life of nations into seven ages, corresponding to the seven ages of man, infancy, boyhood, adolescence, youth, manhood, fecundity, maturity; described the physical organization of society during these periods; and even estimated their duration by the civil calendar as including each seven generations, or seven times thirty-one years. In our own day, the speculations of Walckenaer and Frère have

been pushed with more scientific rigor by the new school of anthropologists, whilst those of Bodin and Montesquieu have been more fully treated by Ritter and Guyot, and carried to the last extreme by Odysse Barot, who has maintained that all nationalities are factitious but those which are bounded by river basins and mountain ranges, and that the perpetual oscillation between the larger artificial and the smaller natural nationalities must at length cause the political map of Europe to settle into coincidence with the outlines of physical geography.

Another class of inquiries has embraced the higher intellectual development of society. Bacon had imbued his Advancement of Learning with the spirit of scientific progress, and Pascal had likened the human race to an individual never dying and always learning through successive ages. Turgot, in his "Plan of Universal History," then distinguished the life of humanity from that of plants and animals as involving an accumulating treasure of ideas from generation to generation, and proceeding through three great intellectual stages, first by referring phenomena to supernatural agents, then to secondary causes, and at last to mere natural laws. St. Simon described such stages as marked by synthetical and analytical processes, organical and critical epochs. Comte characterized the three stages of Turgot and St. Simon as theological, metaphysical and positive, and applied the law to a scale of the sciences which, under its operation, arrive at the positive state successively, in the order of their relative simplicity and generality. The late Henry T. Buckle, in his splendid fragment, the "History of Civilization in England," whilst exalting physical causes such as climate, race, food, soil and scenery, also maintained that human progress is determined by intellectual laws, by the accumulation and the diffusion of knowledge, rather than by any moral improvement, of which he could find no evidence, but rather the contrary, even in the most orthodox countries. More recently, Dr. Draper of New York, in his scientific "History of the Intellectual Development of Europe," proceeding by the inductive method of Vico, upon the physiological hypothesis of Frère, has generalized the individual as the social development and Greek history as an ideal

history, in accordance with which he has sketched European culture through the successive phases of an age of credulity in its infancy, of inquiry in its childhood, of faith in its youth, of reason in its manhood, towards a final age of decrepitude and death.

Another class of inquiries extended to the moral development of society. Butler had argued that virtue ever tends to predominate over vice in civilized communities. Kant, in his "Idea of a Universal History from a Cosmopolitan Point of View," distinctly maintained that ethical phenomena, the acts of free-will, are subordinate to general laws, under which the human race is advancing towards its only rational ideal in a universal republic of virtue and justice. Condorcet, whose "Picture of the Historic Progress of the Human Mind" was written amid the horrors of the French Revolution, heroically proclaimed the progressive perfectibility of society, while it was falling into ruins around him; and after sketching eight stages through which society has passed, from barbarism to civilization, deduced a consequent intellectual progress, which should bring with it such moral and even physical improvement, that crime would cease and men become immortal. Patrick Dove, a Scottish philosopher, advancing beyond Comte and Condorcet with Butler and Kant, in his "Theory of Human Progression," argued the rational probability of a reign of justice in the earth, as involved in the development and application of the moral and political sciences, following in the wake of the mental and physical sciences. Francis Charles Fourier, boldly anticipating such sober presages in his "Theory of the Four Movements," believed himself to have discovered great social laws in the normal working of individual passions and tendencies, acting and re-acting through successive stages of barbarism and civilization, toward a perfect state of absolute harmony between the public and private weal. And with more scientific rigor, M. Quètelet of Brussels, in his sagacious treatise on "The Social System and the Laws which Govern it," has endeavored, by statistical researches, to subject moral as well as physical facts, marriages, births, deaths, crimes, miseries, to fixed laws, under the operation of which society, like the individual, ever tends

to a gradual predominance of the spiritual over the animal nature.

Besides these inquiries, another class has ascended even to the religious development of society. Lessing, in his "Education of the Human Race," referring all revelation to an infantile and pupilage state of humanity, placed Judaism, Christianity, and other religions in connection, as but so many phases in the necessary march of mankind toward maturity and perfection. Pierre Leroux, the zealous expositor of St. Simon, in a treatise on "The Origin and Future of Humanity," by an erudite historical criticism has essayed to trace the issue of Judaism and Christianity in St. Simonism as their only legitimate sequel and complement. Comte, with a bolder generalization, sought to sketch the religious evolution of society through the phases of Fetichism, Polytheism, Monotheism, towards a Positivist Religion of Humanity, as the summit of his completed series of sciences. And numerous other comparative theologians, as we shall see, are studying the religious phenomena of different nations, races and civilizations, with the view of bringing them under general social laws.

But at length all these inquiries have been merged in comprehensive speculations embracing the entire development of society, physical, intellectual, moral and religious. Herder, with such amplitude of view, broached the magnificent scheme of a universal history which, starting with the earth as a planet among the stars, slowly forming for man, should include all human interests in all climes and through all ages, under one Providential plan of development. The French sociologists, St. Simon, Fourier and Comte, not only strove to identify their laws of social order and progress with the universal laws of gravity and attraction; as alike seen in the balancing of suns and planets in the heavens, and in the play of opinions and passions upon the earth; but also attempted to adjust the different phases of the whole human evolution, the intellectual as dependent upon the physical and the moral as dependent upon the intellectual, as in the individual organism. The recent German school of realists, following Herbart, have treated the science of history in a still more profound as well as comprehensive spirit. Professor Hermann Lotze, combining the ge-

nius of Herder and Leibnitz, has connected natural with human history; maintained the perfect consistency of free-will with physical and social laws; and sketched, as in a panoramic series, the entire intellectual, industrial, æsthetical, religious and political developments of mankind. Professor Conrad Hermann of Leipsic, in his "Philosophy of History," while asserting the reign of final causes in history, yet propounds, as its general law, the development of humanity through periods of childhood, youth, manhood and age, which are characterized respectively by art, religion, industry and science, and may be seen illustrated successively in the Grecian, Christian, English and German types of civilization. Professor Lazarus, with more subtle analysis, has been seeking to found sociology upon psychology, to identify the laws of social and mental life, by tracing the growth and condensation of ideas in history, as expressed by poets, sages, heroes and saints, and transmitted in art, science, politics and religion, with increasing facility and compactness, from generation to generation. Frederick Von Hellwald, treating the human species as a transient phenomenon of the earth, in the spirit of Darwin and Hæckel, has written an extensive "History of Culture" in all ages and nations, based upon the principle that the development of civilization is a purely natural process and, like any other, governed by natural laws. Professor Walter Bagehot, in his work styled "Physics and Politics," has endeavored to carry into the same field the new principles of natural selection and inheritance, as explaining the nervous or mental powers and products which are stored and propagated in the progress of civilization. But perhaps the most scientific as well as comprehensive sociology yet attempted, is that of Mr. Herbert Spencer, who has included human society under a general law of universal evolution, of advance from the homogeneous to the heterogeneous, which governs the whole knowable universe; from the primitive nebula up to the most highly organized commonwealth, the same in the globule as in the planet, in the embryo as in the nation, in the habits of insects as in the religions of peoples. And thus, at the extreme point of the inductive tendency in history, all free-will and Providence would seem to have vanished under the reign of law.

As to the third problem, the destiny of society, there have been also two rival schools, the reactionists and the progressionists, or the corruptionists and the perfectionists. According to the former, society is corruptible and ever deteriorating. The East for ages had been immobile and hopeless. Many Greek and Roman writers, from Ovid to Horace, had depicted history as a decline from a golden age, with increasing dissoluteness, towards anarchy and barbarism. Christian fathers and schoolmen, from Tertullian to Bernard, had looked upon all surrounding civilization as the mere waste scaffolding of the Church, about to be consumed in the fires of an impending judgment. And it was not strange that at the Reformation, and amid the political convulsions which followed it, these dogmatic views should sometimes darken the whole prospect of mankind. By large sects and parties, as we shall see, the temporal interests of society were wholly sacrificed to the eternal interests of the individual; earth was treated as a mere scene of trial for heaven, history as but a course of vindictive judgment upon depraved humanity, and time as only a brief respite for accomplishing the number of the elect.

But besides such strictly religious forebodings of a coming social ruin, there were others of a more political and scientific nature. Machiavelli, consistently with his theory, could only describe civil society as ever revolving between the extremes of anarchy and despotism, through epochs of probity and corruption, with no hope of advancing beyond the vicious circle. Bodin, though he read political progress in the past, could see none in the future, but rather disclaimed as alike visionary the Republic of Plato and the Utopia of More. Montesquieu, Gibbon, Ferguson and other historians, speculating upon the rise and fall of empires and civilizations, seem to have reached no more hopeful philosophy than that of the poet, as he mused amid the ivy-covered ruins of Rome:—

> There is one moral of all human tales,
> 'Tis but the same rehearsal of the past;
> First freedom and then glory—when that fails,
> Wealth, vice, corruption—barbarism at last.

Grotius, with the pagan Cicero, simply accepted war as a necessary evil, to be legalized and investigated, without any dreams of universal peace. An English clergyman, Robert Malthus, the founder of a school of political economy in opposition to Condorcet and Godwin, boldly formulated it as a law of Providence, susceptible of mathematical proof, that pauperism is an ever growing evil that can only be checked by such scourges as war, famine and pestilence, and unless precluded by celibacy, must tend to become universal. And in our day, writers abound who, more or less consciously, treat the crimes and miseries which threaten the institutions of the family, property and the whole social order, as so many incurable diseases in the body politic, with a prognosis of certain decay and death.

There have also been like forebodings of a general intellectual decline of society. At the time of the renaissance it was warmly argued by eager partizans, that the ancients far excelled the moderns in wisdom and knowledge, as it is still occasionally maintained that the lost arts and sciences would quite eclipse our own enlightened age. An opinion that in the long course of time there are certain ebbs and floods of the sciences, without any real progress, was ranked by Bacon as the chief obstacle to their advancement in his day. The reactionary critics of the French revolution, De Maistre, De Bonald, Chateaubriand, termed the history of philosophy nothing but a disgusting cycle of errors; treated Bacon and Descartes as mere charlatans; and maintained that there had been little or no real progress even in the physical sciences. And whole schools of philosophical thinkers are still insisting that the moral and political sciences, after ages of effort, continue stationary and circuitous; that the metaphysical sciences are sheer illusions; and, in fact, that all science is but doomed to expire in nescience.

Still more rigorous predictions have been based upon the supposed tendencies to a general physical decline of society. A scientific color has been sought for them, as we have seen, in the influence of disastrous climates, in the decay of degenerate races, in the natural mortality of nations, and in the gradual exhaustion of the earth itself. Ethnolo-

gists, such as Schoolcraft, Kennedy and Nott, can see no progressive future for the effete nations of the East, the enervated peoples of the South and the ice-bound tribes of the North. The Abbé Frère, consistently with his physiological law allotting to nations a natural term of life as fixed as the threescore years and ten of individuals, held that they could only be providentially carried beyond the stationary or decrepit state. David Ricardo, of the same dismal school with Malthus, took it as a principle of economic science, that as population increases, the poorer soils become occupied, the fertility of the richer soils diminishes, labor depreciates, and general impoverishment becomes inevitable. Professor Stanley Jevons has raised the alarm, that the coal-beds of England are inadequate to meet the coming wants of that country. Mr. Greg, as a modern Cassandra, includes among his "Rocks Ahead," a gradual exhaustion of the material resources of nature, as well as a growing social degeneracy. And speculative geologists have predicted an ultimate state of the globe, when all civilization shall have perished under the glaciers of a universal winter.

At the same time, these different presages of the religious, moral, intellectual and physical decline of society have been combined and rendered systematic and imposing. The arts, sciences, polities, religions of successive civilizations, have been supposed to observe great cyclical laws of growth and decay as fixed as the succession of the seasons, the periods of human life, or the cosmic eras of planets, stars and galaxies. Fourier himself, though he assigned to the human race a perfect manhood of seventy thousand years, to be reached through the successive stages of Edenism, savagism, patriarchy, barbarism, civilization, described it as then declining through the same stages in an inverse order, until it should become extinguished with the earth, and the earth itself revert to the nebulous dust of the Milky Way. Ernest Von Lasaulx, applying the law of vitality, of birth and death, to nations as well as individuals, and to the race itself, with all its organic products, its arts, sciences, politics and religions, has maintained that society evolves its classes of peasant, soldier, priest and prince only to dissolve them again by the reverse process;

that after the heroes come the sages, after the doers the thinkers, after the artists the critics; and that already European civilization, though at its flower, gives signs of exhaustion and decline. Matthew Arnold, in some of his plaintive poems, is sighing over the same supposed decadence of modern culture. And Dr. Draper, extending with scientific rigor the law of intellectual development to societies as well as individuals, has described Greece as flourishing and decaying through its childhood, manhood and senility; Europe as just entering its mature epoch of reason; China as waning toward its decrepitude, and the earth itself as growing hoary with wisdom, only then to pass away in the succession of dissolving worlds, like a drop that sparkles in a summer cloud.

According to the progressionists and perfectionists, however, society is perfectible and ever improving. And it was no new opinion. The Western nations had long been restless and hopeful. In the Republic of Plato, and among the sentiments of Cicero and Seneca, had been broached many ideas of social advancement, political as well as moral and intellectual. The community of goods at Pentecost had been advocated by Epiphanius and Chrysostom, illustrated by the monastic orders and witnessing sects of the middle ages, and at the Reformation more or less rigorously applied by the Anabaptists of Germany and the Puritans of England. The Millenarians of the early and modern Church had been looking for a Messianic reign of peace, when the whole earth should become a paradise. And with such purely religious aspirations after social perfection also came dreams of moral and political improvement. Sir Thomas More, presenting to King Henry VIII. and Cardinal Wolsey a work in which he described England as an imaginary island named "Utopia," or No-where, had sketched his ideal commonwealth, which should equalize all classes, fortunes and manners under a patriarchal reign of frugality, innocence and peace. James Harrington, modelling his "Oceana" after the manner of Plato's Atlantis, had looked forward through the storm of the English revolution to the halcyon picture of a free republic, fairer than that of Venice, but which could only be attempted by his political descendants in the true Atlantis beyond the seas.

Morelli, the first of the French socialists, in his "Basiliade or Floating Island," had depicted, under a political allegory, that caricature community of goods, that abolition of property, rank and family, which was afterwards to be so terribly illustrated in the reign of terror. St. Simon then emerging from the American and French revolutions as a philosophical observer, with his proposed "Reorganization of European Society," announced the peaceful coming of such utopias, under his discovered law of organic and critical epochs, with the charms of liberty, equality and fraternity. Victor Considérant, the zealous interpreter of Fourier, in his "Social Destiny," has endeavored to show how individuals, if once released from existing false organizations, would spontaneously group themselves in little communities or phalansteries, under the law of passional attraction, with an absolute harmony of opinions and interests. Mr. Nordhoff has sketched such experiments as tried in different parts of the country. The red republican Cabet, transferring the utopia of More from the island to the continent by his imaginary "Travels in Icaria," has drawn a brilliant picture of modern French civilization, as transformed, from the smallest village up to the capital, by the principles of Communism. And numerous other sounder philanthropists, from William Penn to Charles Sumner, assailing the wider evils of war, slavery and caste as but legalized crimes against civilization, have been predicting their ultimate extinction under the natural laws of trade, diplomacy and amity, by means of commercial leagues, peace societies and congresses of nations.

There have been still more sanguine dreams of intellectual as well as political progress and perfection. Campanella had imagined his "City of the Sun," whose inhabitants, living by intelligence, were devoted to the pursuit of philosophy and the sciences; whose chief magistrate was chosen over his rivals as the greatest metaphysician, with the title of Sun; and whose very marriages were scientifically assorted with a view to the intellectual perfection of the species. Bacon, in his "New Atlantis," had dreamed of a similar home of perfect science as the distant goal to a future advancement of learning, compared with which antiquity would seem but

the childhood of the world. Perrault, taking the part of the moderns against the ancients, had likened the apparent ebbs and floods of the arts and sciences to rivers, which plunge awhile under ground, only to emerge again with increased fullness and power. The progressive reformers of the French Revolution, Turgot, Condorcet and St. Simon, then traced the career of past philosophy, through successive intellectual stages, towards positive knowledge; hailed Bacon and Descartes as the heralds of a new era of enlightenment; and showed the perfection already attained in the physical sciences. And whole schools of philosophical mystics are claiming that they have completed the circle of the mental and moral sciences; that they have brought the metaphysical sciences within the grasp of their own consciousness; and, in short, have seized all science by a sort of intuitive omniscience.

There have been still bolder visions of a coming physical progress and perfection. Scientific data have been sought for them in the evidence of improving climates and species, in the survival of favored races and nations, and in the industrial development of the globe. Palæontologists have contrasted the present refined floras and faunas with the coarser organisms of the primeval earth. Ethnologists, such as Crawfurd, Tiedemann and Guyot, have dwelt upon the indestructible vitality of the Jewish blood, in contrast with the Egyptian, the Greek and the Roman; upon the increasing size and quality of the Anglo-Saxon brain, and upon the unprecedented mixture of races and climates in America, as tending to the development of a new and higher type of nationality. Political economists, like Henry Carey, reversing the dreary doctrines of Malthus and Ricardo, have maintained, with elaborate arguments and statistics, that superfecundity disappears as we ascend the animal and intellectual scale; that the poorer soils are exhausted before the richer; and that science and industry admit no limit to the means of subsistence. And more speculative socialists, such as Condorcet, St. Simon and Fourier, giving reins to their fancy, have looked forward to a time when the human body, through physiological skill, shall become practically immortal; when Homers and Newtons shall abound by the million; and when, under organized industry, the whole desert

earth shall have been reclaimed and transformed into a garden, and even the sea converted into a wholesome beverage.

At times, too, all these glowing prophecies of moral, intellectual and physical progress have been blended into one brilliant picture of human perfection. It has been argued that the arts, sciences, polities and religions of successive eras, instead of running in fatal cycles, are ever advancing, as under spiral laws of average progression, which still preserve and improve the species, though individuals live and die, though nations rise and fall, though mighty civilizations flourish and decay. Vico himself, while he saw only the same stages ever returning in history, seems to have admitted that, with each recurrence, they were enriched with nobler manners and laws, thus promising a future Italy as much better than the present as Christian Rome was better than Pagan. Pascal and Turgot not only distinguished the human species from the individuals which compose it, as knowing no birth or death, or childhood or age, but exalted it over those vegetable and animal races which only move in the same cycles, generation after generation, while it is ever progressing, through successive epochs and civilizations, with growing knowledge, wealth and power. Jouffroy, in much the same spirit, has ingeniously argued that this mobility, this progressiveness of humanity, is due to its intelligence, to the succession of ideas, as expressed by leading minds and organized by the masses; that already the march of intelligence, the growth of ideas, can be discerned in the past career of mankind; and that of the three great civilizations now on the earth, the Christian is destined to prevail over the Mohammedan and the Brahminical, by virtue of its intellectual superiority and vigor, under the leadership of the foremost nations, England, Germany and France. Other writers, with as much patriotism as philanthropy, have dwelt upon the prospects of American civilization, starting with the accumulated advantages of the European, Asiatic and African civilizations, and resuming all climates, races, polities and religions. Butler even hinted long ago, as a strictly scientific conjecture, that reason tends to predominate over brute force, and virtue over vice, not only in some future state of society on earth, but throughout the universe, in distant

scenes and periods, where all pure intelligences shall have discovered each other and combined together under the laws of intellectual and moral affinity and progress. Numerous philosophers, too, from purely rational premises, have been arguing that it is the very tendency of civilization, as well as aim of history, to subdue the whole earth to the service of man, to free him from all physical as well as political tyranny, and to open before him an indefinite career of expansion and improvement. And certainly, if we carefully study the several material, intellectual, moral and religious developments of society, in their normal order and mutual dependence, it will not seem wholly visionary to project their combined issues in some remote epoch, when art shall have triumphed over nature, science over error, society over the individual, Providence over humanity, and earth shall be absorbed into heaven, as a star fades into the dawn.

The rational section of sociology is thus seen to present to us a complex organism composed of individuals, families and nations, endowed with physical, intellectual, moral and spiritual capacities for art, science, polity and religion, and having had a corresponding evolution of its capacities in history from an early state of barbarism to its present mature forms of civilization. If our positive knowledge of this social organism be more vast than exact, still less of scientific quality can be claimed for the hypotheses held concerning its origin, development and destiny. As yet, these are largely based upon partial inductions, upon misleading analogies and upon narrow prejudices. While the course of ancient history may seem to have favored the notion of divine right, yet that of modern history has seemed more favorable to the idea of a social contract. Although the resemblances between individual and social development are most striking and truthful, yet their advocates differ endlessly in their mode of treating them; some making the correspondence mainly physical, and tracing chronologically a birth, youth, age and death of nations and races; others making it chiefly intellectual, and unfolding logically the progress of the arts and sciences in different countries and epochs; others making it wholly moral or political, and showing the successive advances

of civilization as measured by popular virtue and freedom. Even when these general developments are adjusted, the physical to the intellectual, the intellectual to the moral, the problem only becomes too complex to be solved upon data so vague and meagre. Moreover, all these speculations are charged with conflicting prejudices, and each of them championed alike by divines and civilians, churchmen and statesmen. Therefore, they cannot yet be brought scientifically into relation with any religious dogmas of sociology.

In the revealed section of this science, also, may be traced corresponding degrees of divergence from the rational theory of society. In the first stage occurred the great religious revolt from a false theocracy, the vicious predominance of the court of Rome. It was the reforming period, when the Church was everywhere returning to its normal position and relations as a spiritual body, independent of the State, and its new founders were striving to reorganize it on more Scriptural and rational principles. Savonarola, Wickliff and Huss had led the way as martyrs to ecclesiastical liberty. Chancellor Gerson of Paris, styled the most Christian Doctor, in the great council of Constance, took the first bold stand against that papal autocracy, before which subsequent councils and churches only quailed in submission, until Luther burnt the pope's bull at Wittemberg. Thomas Cartwright, whose Directory of Church Government cost him his chair at Cambridge, led the first English Presbytery against that alleged divine right of bishops, which distracted the British kingdoms with sectarian warfare until the separate establishment of the churches of England and Scotland. Godwin and Nye were at the same time assailing the divine right of presbytery. Jeremy Taylor, when a schoolmaster in Wales (through what he termed the gentleness and mercy of a noble enemy), wrought out those principles of religious toleration in his Liberty of Prophesying, which, though soon repudiated by the Act of Uniformity, were yet to be vindicated in the American churches. George Whitefield, the apostle to the new world, whose common-place sermons kindled the young colonies as with a tongue of flame, breathed that spirit of evangelical alliance which still glows in both hemispheres. John Wesley

meanwhile was founding a new eclectic polity, destined to rival the oldest historical churches. At length Thomas Chalmers, the greatest reformer since Knox, sundering life-long ties to a state-religion which he had eloquently defended in his Christian Polity, led forth the Free Church of Scotland as pioneer in a process of disestablishment, already spreading throughout Great Britain, and indeed throughout Christendom. And in connection with various practical movements towards unity of faith and worship among the Greek and Anglican, the Episcopal and Presbyterian communions, large-hearted Christian scholars, of every name, are proceeding, with fresh historical research, to define anew the Scriptural doctrine of one Catholic and Apostolic Church as the mystical body of Christ and temple of the Holy Ghost.

But meanwhile, in the next stage of indifference, as if wholly unconscious of the new science of society which has been emerging, have appeared various ecclesiastical schools still adhering to traditional dogmas concerning the nature, the history, and the triumph of the Church. As to the nature of the Church, opinions diverged at the Reformation. Roman Catholics, such as Bellarmin, defined the Church a visible society, or polity, as visible as the Kingdom of France or the Republic of Venice, composed of men united in the profession of the Christian faith and the communion of the sacraments, under the government of lawful pastors, and chiefly of the Roman Pontiff who, as the successor of St. Peter and vicar of Christ, is invested with supreme dominion, both temporal and spiritual. Anglicans, such as Palmer, have substantially adopted the same definition, rejecting only the primacy or supremacy of the Bishop of Rome. Some Presbyterians have been inclined to a similar view, restricting the apostolic succession to presbyters as on a par with bishops or prelates. But the great mass of Protestant and Reformed divines, such as Luther, Calvin and Zwingle, defined the Church an invisible society, or communion of saints, of which Christ is the only spiritual head, and all true believers the members, wheresoever they may be found, and howsoever they may be organized, whether with a polity derived historically from the Church of the Apostles, as by the Episcopalians, or simply

copied after the model of that Church as by the Presbyterians, Methodists and Lutherans, or substantially framed upon the same ecclesiastical principles, as by the Baptists, Congregationalists and Unitarians. And while all have agreed in rejecting the Roman dogma of the supremacy of the Church over the State, they have differed endlessly, in theory and practice, as to the extent to which the Church should be independent of the State, or may be susceptible of union and combination with it.

As to the history of the Church, the great body of ecclesiastical historians has shown a like diversity of views, with the same apparent disregard of the accompanying secular development. First came the Protestant schools, constructing history, polemically, against Roman Catholicism. Mathias Flacius of Illyricum, organizing German learning at Magdeburg in a collection of topical histories termed the "Magdeburg Centuries," ignored all European civilization but the primitive and reformed Churches, as connected by a few anti-papal witnesses of the truth in the middle ages. Then followed the Roman Catholic school constructing history, polemically, against Protestantism. Cardinal Cæsar Baronius, stigmatizing the folios of Flacius as mere centuries of Satan, and substituting for them his own "Ecclesiastical Annals," packed from the Vatican library, admitted nothing into European civilization but the mediæval papacy, classing the Reformation itself with Arianism, as a mere incidental heresy. And to this school belonged the still more polemical histories of the Gallican prelates, Fleury and Bossuet. Afterwards appeared the various sectarian schools, constructing history exclusively in the interest of some particular church or denomination. David Calderwood, deprived of office for his opposition to prelacy, wrote his standard "History of the Church of Scotland" against the Episcopalians; Peter Heylin, reinstated by the Restoration, composed his retaliatory "History of the Presbyterians;" Daniel Neal, in his well-known history, defended the Puritans against both Presbyterians and Episcopalians; and a host of other ecclesiastical partizans converted English history into a battle-ground, where primitive apostles, elders and synagogues were made

to reappear and masquerade as modern bishops, presbyters and congregations, in defiance of all surrounding civilization. At length came the pietistic schools, constructing history exclusively in the interest of mere personal religion. Joseph Milner, an English clergyman of the evangelical type, composed his Church History avowedly on a new plan, for the celebration of genuine piety alone, deliberately excluding all other elements of Christian culture as unedifying. And other writers of the same school, such as Arnold, in his Impartial History of the Church and of Heretics, have carried this unscientific method to the extreme of glorifying mere schismatics as the heroes of Christianity, and making all contemporaneous history, with all great secular interests, revolve around a party or a sect.

As to the triumph of the Church, or Church of the future, opinions were also divided. Roman Catholics drew the distinction between the Church militant and the Church triumphant, including in the former the earthly hierarchy of clerical orders, headed by the Pope, and in the latter the heavenly hierarchy of saints and angels, crowned with the Virgin Mary. Protestants generally restricted their distinction between the invisible and visible Church to this world alone, and looked for the coincidence of the two, in a perfected Christian polity, at the end of the present dispensation; some anticipating this Church of the future in the ordinary course of history and Providence; but the great mass, especially the Millennarians, predicting it as a new miraculous economy, to be introduced by the visible return and reign of Christ at Jerusalem.

Sociology, rational and revealed, it will now be seen, has brought before us more problematic than strictly scientific materials. But few attempts as yet have been made to harmonize dogmatic with hypothetic views of the origin, development and destiny of society. They rather tend apart to the wildest extremes. While the Christian socialist would at length merge the State in the Church as a divine institution, the infidel socialist would at once obliterate the Church with

the State in some new human organization by a revolutionary process.

We are now at the point where sociology adjoins theology viewed as a science of religions.

SECTION VI.

Theology, Rational and Revealed.

On the rational side may be traced a gradual divergence from the whole revealed doctrine of religion. In the first of the three stages of departure came the glad escape from a false biblical theology, from the dry, systematic divinity of the schools. It was the time when the works of God began to be studied together with His word, and brave spirits and free-thinkers, as well as intelligent believers, were asserting the rights of reason against mere authority in religion. Raimond of Sebonde, a professor of medicine and a loyal disciple both of Aquinas and Albertus, early in the fifteenth century had written a treatise on the Book of Creation, in which nature and revelation were described as two volumes, interpreting each other, whilst the doctrine of divine rewards and punishments was deduced from the moral constitution of man as well as the law of God. Montaigne, having translated the work of Raimond under the new title of Natural Theology, had proclaimed in France that right of free examination into religion, which was afterwards to be more distinctly enunciated by Collins in England and Reimarus in Germany. Herbert of Cherbury, the father of modern deism, in his treatise on Truth as distinguished from Revelation, then for the first time advocated mere natural religion as alone sufficient and absolute, while in his Religion of the Gentiles he even anticipated the problems of the latest comparative theology, by attempting to separate the essential truths common to Heathenism and Christianity. Spinoza, the father of modern pantheism, probed that metaphysical question of the immanence of God in the world, which the profoundest thought since then has been pursuing. Descartes, renewing the ontological theism of Augustine and Anselm, with his terse

formula "I think God, therefore God is," reasoned from the conception to the existence of a perfect being, the very idea of whom, like that of a triangle, must involve the reality; and thus opened the path pursued by Samuel Clarke, Mendelssohn and Cousin. Christian Wolf, renewing the cosmological theism of Diodorus and Hugh St. Victor, in his Rational Theology, argued from the dependence of the world as a contingent effect to the necessity of a God as its only sufficient reason and cause; and thus prepared the way for Bilfinger, Baumgarten and Meier. Derham, renewing the teleological theism of Athanasias and Aquinas, in his Physico-theology, collected from the existing natural sciences those evidences of design in nature, of the Power, Wisdom and Goodness of the Creator, which were to be more fully unfolded by the Boyle lecturers and the Bridgewater essayists. Crusius, renewing the moral theism of Tertullian and Raimond, in his Guide to a Reasonable Life, deduced from the natural conscience those proofs of a spiritual Lawgiver and Judge, which have since been elaborated by Kant, Fichte and Hamilton. At length Bishop Butler, assuming a demonstrated theism from these combined arguments, proceeded in his Analogy, by a course of inductive logic, to lay a foundation in the mental and moral sciences for those remaining articles of essential religion, the Divine Government, natural and moral, the Future State of Rewards and Punishments, and the Present State of Probation and Discipline, which had been systematized by Toland, Morgan and Tindal. Since then, too, that Catholic deism of Justin Martyr and Savonarola, which was to be derived from the consent of nations, from the internal coalescence of religions, has begun to find more or less avowed promoters in the travellers, missionaries, antiquarians, mythologists, philologists and historians, who have been bringing Christianity into connection with the Judaism, Hellenism and Mohamedanism of the ancient world, as well as the Brahminism, Budhism and Polytheism of the present day. And thus the materials have been collected for a new science of religion, treated as a universal human phenomenon, regulated by psychical and social laws.

Connected with these investigations, however, there also

appeared in the second divergent stage numerous hypotheses, scarcely scientific as yet, concerning the origin, the development and the destiny of religion, of natural or essential religion, as manifested in the individual and in society. As to the first of these problems, the origin of religion, there were the two opposite schools of naturalism and supernaturalism, of rationalism and scripturalism. According to the latter, all real religion is supernatural and revealed. And it had been so held from the beginning. The Greek apologists, Justin Martyr and Clement, had described any kindred truths of heathenism as but the germs of the Christian Logos, and styled Plato himself a mere Hebrew philosopher, who had borrowed his teachings from the Old Testament. The Latin apologists, Tertullian and Minucius Felix, had denounced the myths and oracles of paganism as Satanic mimicries, and claimed that its counterfeit doctrines could only suggest either that the Christians were philosophers or that the philosophers had been Christians. In the middle ages, also, the Mohammedan and Scandinavian religions had been treated as mere diabolic or human inventions, to be destroyed rather than converted. And though scholastic doctors, such as Anselm and Aquinas, had begun to frame the great theistic argument, since so famous, yet it was only as corroborative of a revealed divinity, which was held to be beyond the reach of unaided reason. But since the Reformation the rise of deism, as an independent religion of nature, has provoked anew at the centre of Christendom the battles which the early Church once waged on the confines of heathendom, and various attempts have been made to reclaim and explain the religious tenets which had been captured, as it were, from Christianity.

As a first class of proofs, it was urged that a spiritual revelation of religion is necessary and important. Dr. Halyburton of St. Andrew's, in an elaborate work entitled Natural Religion Insufficient and Revealed Necessary, argued against Herbert that the light of nature is wholly defective as to the being of a God, a rule of duty and a future state, and that the five articles of the supposed absolute and universal religion do not, as a matter of fact, obtain beyond the pale of the Chris-

tian revelation among heathen nations. Bishop Conybeare, in a similar Defence of Revealed Religion against Tindall, maintained that the true religion of nature is not derivable from reason alone, even by the wisest men; that if perfected, it could not solve the most essential questions of all religion, such as the pardon of sin, the means of reformation and the awards of futurity; that what little truth it contains needs to be confirmed and completed by a supernatural revelation; and that the known miraculous and prophetical proofs of such a revelation are more obvious to common minds than the most elaborate reasonings of deists and philosophers. Chapman, in a treatise styled Eusebius, replied to Morgan, that the peculiar truths of a revealed religion cannot be tested by our mere rational and moral faculties; that miracles and prophecies are the proper proofs of such a religion; that the Jewish and Christian Scriptures have come down to us amply sustained by such kind of evidence; and that the attempt to extract from them a Christian deism conformable to reason and the fitness of things, by sacrificing the Old Testament and modifying the New, is simply subversive of all religion, both natural and revealed. Dr. Leland of Dublin, besides his special replies to Tindal and Morgan and his View of Deistical Writers and their opponents, completed his labors with a learned treatise on the Advantage and Necessity of the Christian Revelation, as evinced by the state of the ancient heathen world. At length Bishop Butler, in the second part of his Analogy, condensed and arranged all the arguments of his predecessors in one compact course of reasoning, repelling every conceivable objection to revealed religion, and establishing it in harmony with the general scheme of nature and Providence. And since that time little of value in the same vein has been added by any English or German writer, unless it be the argument of Chalmers, that Natural Theology, as its last word, still calls for a revelation.

As another class of proofs, corroborative of the former class, it has been urged that all natural religions are themselves traceable to the Jewish and Christian revelation. The learned Theophilus Gale, in his work, The Court of the Gentiles, thus essayed, by ingenious historical and philological

parallelisms, to refer the whole Grecian and Roman religion and philosophy to the Word of God, as mere borrowed light from that sacred fire. Cudworth even sought for traces of the Trinity in Platonism. Against the early deists, also, it was held that their so-called natural religion had been unconsciously derived by them from the Christian Scriptures, since it could not be found either in ancient or modern heathenism, being somewhat like the fiction of the social contract which can be traced in no existing government. And more recently, with our growing knowledge of the other extant religions of the world, eager apologists have been striving to explain them, as mere counterfeits or corruptions of Judaism and Christianity. The school of Tertullian has been revived by writers, such as Morris and Holsam, who would maintain, against learned and philosophical Hindoos, that the monstrous triads, avatars and human sacrifices of Brahminism are but infernal parodies of the trinity, the incarnation, and the atonement, or distorted fragments of primeval prophecies, and that the grosser rites of polytheism are, as they claim to be, mere devil-worship and sorcery. In distinction from such views, however, the late Archdeacon Hardwick, Christian Advocate in the University of Cambridge, in his thoughtful treatise, Christ and other Masters, after proving the unity of the human race and the prophetical character of Hebraism, as contrasted with Brahminism, Budhism and Polytheism, has endeavored to show that any real correspondences between Christianity and those religions, such as the facts of the fall, the deluge, the rite of sacrifice, may be referred to floating traditions, borne away in the great primeval migrations to Asia, America and Africa, whilst the apparent doctrinal correspondences above mentioned are due to international intercourse at later periods. The distinguished orientalist, Abel-Rémusat, maintained that Budhism in Thibet had been so modified by the Nestorian missionaries and early European travelers, that it might almost be termed the Christianity of the East. The Abbé Huc and Rev. Samuel Beale have explained the same coincidences in like manner. Other writers, with Frederick Schlegel, have sought traces of a much earlier and more general connection. Henry Lüken, Roman Catho-

lic Professor at Münster, in an elaborate work on the Traditions of the Human Race, has gathered evidences of a primeval revelation, from all ancient and modern nations and tribes, as afforded in their legends of the fall and the deluge, and in Messianic presages of the coming of Christ and the end of the world. Ernest Von Bunsen, in his Unity of Religions, described it as a secret tradition, preserved by all peoples in their migrations. Professor Moffat, in his Comparative History of Religions, has also proposed to connect the great systems of India, China and Persia with an aboriginal revelation, the patriarchal monotheism of Noah, from which they have been departing through various revolutions, whilst Judaism and Christianity have retained and completed it. The Jesuits thus sought to trace the ancient wisdom of the Chinese to the patriarchs of Scripture. Living Protestant missionaries in different fields are also seeking for such traditions as part of their aggressive work against heathenism. And a similar apologetic has been attempted by the late Bishop Meade of Virginia, in a popular volume entitled The Bible and the Classics, with the view of counteracting the pagan tendencies of Greek and Latin literature in schools and colleges.

But as a conclusive class of proofs, including yet transcending the other two classes, it is now urged that all religions spring from a universal revelation which, in Christianity alone, is matured and completed. That Judaism was thus resumed in Christianity has always been the orthodox belief; that natural religion is but an essential part of revealed, was the standing reply to the English deists; and the school of Justin Martyr seems to be re-appearing, with reference to a similar divine origin of ancient and modern heathenism. The first step may have been unconsciously taken by classical scholars, such as Nägelsbach, Lübker and Tyler, who have developed the theology of Homer, Euripides and Sophocles, or such as Ackerman, Baur and Tayler Lewis, who have discriminated the Christian elements in Socrates, Plato and Tacitus. And with the growth of a more philanthropic spirit or a pantheistic conception of humanity, it has not been strange that such fragmentary truths, in the purer pagan literature, should have been hailed as refracted rays or scintillations of that Divine

Word, which shines fully in Christ alone, yet lighteth every man that cometh into the world. Upon some such general principle Schneider, in his Christian Chimes from the Grecian and Roman Classics, after citing the apostles, fathers and reformers to prove his position, has compiled and arranged an immense variety of heathen maxims and Scripture texts, as in a sort of concordant catechism, including every article of faith. Mr. Gladstone, also, in his scholarly treatise on Homer and the Homeric Age, argues that Greek mythology is not so much a deification of the powers of nature, as a corruption of old theistic and Messianic traditions. The late Bishop Trench, in his Hulsean lectures, entitled Christ the Desire of all Nations, has depicted, in a striking light, the unconscious prophecies or instinctive yearnings of the whole heathen world toward some Great Deliverer from sin, Vanquisher of death, Prophet, Sacrifice and Founder of a new spiritual kingdom. Dr. Dorner, in his profound and erudite History of the Person of Christ, has shown that the universal idea of a God-man, that pervades all religions, could not be realized in Budhism, which humanized God; nor in Hellenism, which deified man; nor in Judaism, which sought a political Messiah; nor in Alexandrian Platonism, which dreamed of an impersonal Logos; but only in Christ, the Incarnate Word, as defined in the Gospels and subsequently unfolded through the stages of dogmatic history. And Professor Edmund Spiess of Jena, whose Logos Spermaticos is a learned collation of parallel passages from the Grecian and New Testament writings, has maintained, in a suggestive memoir before the Evangelical Alliance, that the consensus of Christianity with other religions includes, as germs of the divine word, certain essential truths common to them all, such as the fall of man and future awards, while its dissensus from them reserves the great doctrine of the atonement as the proper theme of its own special revelation. It thus appears that, by orthodox writers, all religion is supposed, in some form or degree, to be revealed.

According to the rationalists, however, all religion is purely natural and rational in its origin. And this opinion was also of ancient growth. The early infidels, Celsus and Porphyry,

had been fain to reclaim Christian doctrine as but the true Logos of Plato, and supersede the Hebrew prophecies with heathen oracles. The later infidels, Hierocles and Julian, had even matched the miracles of Jesus of Nazareth with the feats of Apollonius of Tyana, and striven to supplant the severe graces of the new religion with the romantic charms of the old mythology. And though all feeling for any form of heathenism disappeared during the mediæval conflicts with the Goth and the Saracen, yet, on the decline of the Crusades and with the classical revival, came the schools of Boccacio and Erasmus, identifying heathen gods and goddesses with the Trinity, the Virgin and the angels, and praising Grecian poets and philosophers at the expense of Christian doctors and saints. The former likened the three great religions, Judaism, Christianity and Mahometanism, to three rings, so much alike that the genuine could not be distinguished from the copies. And even among the reformers, Luther expressed pious hopes for the salvation of Cicero, and Zwingle incurred censure for his unguarded praise of heathen moralists and sages. Early in the seventeenth century, Tobias Pfannerus wrote a learned treatise on The Purer Gentile Theology, in which he labored to show how nearly ancient pagans, by the light of reason and tradition, had approached the true religion in each of its most peculiar dogmas, and concluded with an essay on the salvability of the heathen. But it was not until Protestantism had been perverted into free-thinking, that such comparisons were undertaken in an unchristian spirit, and open efforts were made to recover the lost battles of the early pagan scepticism with the Christian faith.

At the outset of this great re-action, it was simply attempted to reduce Christianity to mere natural religion. Lord Herbert began the movement by compiling a Religion of the Laity and of the Nations, which would exclude every distinctive Christian tenet, but the existence of a God, the duty of worship, the claims of virtue, the efficacy of repentance, and the motive of rewards and punishments. John Toland of Ulster, a Catholic, a Protestant, a Dissenter, at length a Pantheist, in his Christianity not Mysterious, provoked more than fifty replies, by maintaining that revealed truths are

neither contrary to reason, nor above it, but, when once made known, as intelligible and plain as any other truths naturally within the reach of our faculties. Dr. Mathew Tindal, Lawfellow at Oxford and Judge-ecclesiastical in London, near the close of his life published his "Christianity as old as the Creation," in which he argued that natural religion, or the law of nature, is absolutely perfect and obvious to the conscience of all men, that it neither requires nor admits of an external revelation to explain and enforce it, and that the pretended Jewish and Christian revelations are defective in their evidences, obscure in their statements, immoral in their teachings, and without the universality and force which belong to the religion of nature. At length Morgan completed the attack of Tindall upon the internal distinctive truths of Christianity, as Collins and Woolston had already assailed its external prophetical and miraculous evidences. And the system thus elaborated was only reproduced, more or less fully, with French wit by Voltaire and Rousseau, in the Encyclopædia; with German culture by Reimarus and Lessing, in the Wolfenbüttel fragments; and with New England seriousness, by Channing and Dewey, in the form of Unitarianism.

It was next attempted to merge Christianity among the other religions of the heathen world. Sir Charles Blount, a disciple of Hierocles and of Herbert, at the close of the seventeenth century, republished the Life of Apollonius, the fabulous miracle-worker of Tyana, with the view of involving Christianity in the dark suspicions which rested upon ancient paganism. In the same spirit, Dupuis and Volney, at the close of the last century, in their work upon the origin of cults and the revolutions of empires, dared to rank Christ with Hercules and Adonis, and to class Judaism and Christianity, with other ancient religions, as mere inventions of priestcraft, or varieties of the universal worship of nature. Since Voltaire sneered at the supposed resemblance between the Hindoo triad and the Christian trinity, sceptical travelers, antiquarians and linguists, such as Holwell, Lubbock and Burnouf, have insinuated that the Hebrew monotheism, ritual and angelology were largely borrowed from the neighboring systems of India, Egypt and Persia; as by a like international

commerce of religions mediæval Christianity now appears in the Lamaism of Thibet, even to the use of the cross, rosary, holy water, vestments, litanies and processions. And while non-Christian writers have thus been aiming to make revealed religion equally false with all natural religions, as being alike with them a mere relic of primeval barbaric superstition, some unwary apologists and comparative theologians, of the liberal school, have been representing it as only equally true, or at least magnifying its consent with them, rather than its dissent from them. Wolf and Priestley thus suffered a double misconception for having too favorably compared Confucius and Socrates with Christ. Creuzer, in his great classical work on the mythology of all nations, whilst admitting that among known religions the Christian is best adapted to the moral nature of man, yet maintained that it owes its superiority, in doctrine and worship, to their preparatory ministry. The late Professor F. D. Maurice, in his Boyle Lectures on the Religions of the World, after distinguishing their characteristic doctrines, dwells upon the Mohamedan, Brahminical and Buddhist sides of Christianity as being fraught with danger or benefit, according as they are repressed and exaggerated, or kept in their due proportions and relations. Dr. James Freeman Clarke, in his examination of the Ten Great Religions, whilst assigning to each of them some vital truth and Providential warrant, such as spirituality to Brahminism, morality to Confucianism, penitence to Boodhism, simply maintains that, since they are ethnic, partial and arrested growths, Christianity alone is catholic, complete and progressive, fitted to supersede them as the religion of the whole human race. The late Theodore Parker, advancing more boldly, in his Discourses of Religion, classed Christianity with the different forms of Fetichism, Polytheism and Monotheism, as only the highest extant phase of an absolute religion, pervading all ages and countries, and embracing a paradise into which the swarthy Indian, the grim-faced Calmuck, the Grecian peasant, shall come from the East and West, to sit down with Moses and Zoroaster, with Socrates and Christ.

But the final effort has been to derive all religion, including Christianity, from the mere reason of man. That ancient

and modern heathenism thus originated had long been the general belief; that natural or essential religion is discoverable by mere reason, without the aid of a revelation, was but the peculiar boast of the English deists; and the school of Celsus and Porphyry would seem to have returned, as respects a like human origin of Judaism and Christianity. The way was incautiously opened by such devout philosophers as Wolf, Locke and Kant, striving to demonstrate the dogmas of revealed theology, to prove the reasonableness of Christianity, and to confine religion as mere morality, within the bounds of pure reason; by such philosophic divines as Schleiermacher, Wegscheider and De Wette; and still further, by such daring thinkers as Hegel, Schelling and Fichte, in their philosophies of religion, of revelation and of mythology. And it only remained, by combining the speculative spirit with critical research, to separate the mythical from the historical element in sacred as well as classical antiquity, and exhibit Jehovah as but an Israelitish Jupiter, Samson as but a Hebrew Hercules, Jesus as only a Jewish Socrates, and Christianity itself as mere mythology. David Frederick Strauss, in his celebrated Life of Christ, after maintaining the possibility of myths in the New Testament, discriminating between their philosophical and historical marks, and giving rules for detecting them, proceeded to rally all previous English, French and German skepticism against the literal truth of the gospel histories, with the view of resolving them into pious creations of the evangelists, which they had artlessly woven out of a few extraordinary facts, combined with Messianic traditions. Bruno Bauer, rebounding from the orthodox to the infidel side of Hegelianism, then completed the destructive criticism of Strauss, in the Synoptical Gospels, by assailing them as conscious inventions of their authors, mere dogmatic afterthoughts, which they had engrafted upon the original narrative of St. Mark. Meanwhile, Ferdinand Christian Baur, leader of the Tübingen school, by a more subtle dissection of the Acts and Epistles of the Apostles, essayed to trace the Christianity of the First Three Centuries, from its early Jewish and Gentile phases in the rival schools of Peter and Paul, to their coalescence in the Council of Nice, together with the

subsequent development of the Trinity, the Incarnation and the Atonement, through successive stages of dogmatic history, into the forms of the Hegelian dialectic. At length Ludwig Feuerbach, assailing the dogmatic as well as historic faith, retained in his "Essence of Christianity" nothing but the idea of God as a mere abstraction of the understanding or personification of humanity, evaporated theology into anthropology, and reduced piety itself to mere hallucination. And thus, by the extreme rationalists, all religion would be rendered purely mythical and illusive.

As to the second problem, the history or development of religion, there were also two rival schools, the one referring it to Providential dispensations and interpositions, the other to mere mental and social laws. According to the former, religion advances in history by a series of miraculous economies, messengers, incarnations, revelations. Many of the early Christians, especially the Montanist fathers, Ignatius and Tertullian, and also Lactantius, held that as Heathenism and Judaism had been superseded by Christianity, so Christianity itself was about to be superseded by a more complete apocalypse with a Second Advent of Christ, General Resurrection and Judgment of the world, and reign of the risen saints upon earth for a thousand years. The same Millenarian view was revived in the thirteenth century by the Fratricelli, or advocates of the so-called "Eternal Gospel," such as Joachim, Amaury and John of Parma, who contended that Judaism was the dispensation of the Father, Christianity that of the Son, and a new approaching dynasty that of the Holy Spirit; the first heralded by the twelve sons of Jacob, the second by the twelve apostles of Christ, and the third by the twelve angels of the heavenly city. According to Postel, such successive economies are connected with four distinct incarnations or births of Christ, first in the divine nature as the Son of God, then in Adam as the head of the human race, at length in the Virgin Mary as the founder of a new spiritual kingdom, and at last in the resurrection as the Redeemer of both man and nature. At a later period similar views, but in a more chimerical form, were associated with the occult sciences by the Rosicrucians, Paracelsus, Bœhme and Fludd, who represented

Christianity and Mohamedanism as destined soon to give place to a new religion, whose followers would enjoy perpetual youth, immortality and magical, physical powers. After the reformation, in connection with the political ferments of the time, the same opinions were advocated, in a still more practical manner, by the Anabaptists in Germany, and conspicuously by the Fifth Monarchists of the English Revolution, who believed that the four great antichristian monarchies projected by Daniel in history, the Babylonian, Persian, Grecian and Roman, were about to be succeeded by the return of Christ and reign of the saints in a theocracy forcibly established upon the ruins of all earthly kingdoms. And at length, in recent times, such speculations have been recast, with more or less scientific pretension, as a theory of universal religion.

In this way are explained the relations of Christianity to ancient and modern Heathenism. The early ecclesiastic historians, such as Bossuet, Prideaux and Shuckford, as we have seen, endeavored to connect all sacred and profane history together in one world-wide scheme of divine dispensations for the destruction of the false religions of the heathen world, and the vindication of the one true religion revealed in the Jewish and Christian Church. Jonathan Edwards, in the same spirit, but with more dogmatic precision, sketched a History of the Work of Redemption as devised among the sacred persons of the Trinity and executed in human history by vast providential economies, extending from the fall of man to the incarnation of Christ and the end of the world, and involving the overthrow of heathenism, in its modern as well as ancient forms, by means of special interpositions and supernatural judgments. Learned interpreters of prophecy, such as Mede, Lowth and Keith, have regarded the four beasts in the book of Daniel as denoting the great pagan powers of Assyria, Persia, Greece and Rome, which have been successively subverted by Divine Providence in order to make way for the universal monarchy of Messiah at the end of the present dispensation. Consistently with such views the great enterprise of foreign missions has been organized as a moral crusade against the modern anti-Christian systems of Brahminism, Budhism and Polytheism; while the whole Millennarian school

of our day attach no higher importance to the work than as a vindicatory proclamation of the gospel against surviving Gentile religions which are so utterly false that they can neither be reformed nor converted, but must be simply destroyed at the ever-imminent coming of Christ in judgment.

In the same manner have been explained the relations of Christianity to ancient and modern Judaism. While it has ever been the orthodox belief that the Old Testament has been fulfilled in the New, yet as to the mode and extent of that fulfillment there have been different schools of interpretation. The earlier school of Glass, Cocceius and Witsius, though disclaiming the allegories of the fathers, almost equalled them by maintaining that everything in Judaism was typical of something in Christianity, not merely the few antitypes mentioned by the apostles, but the entire Jewish ritual and history, the most trivial ceremonies and incidents. The more sober school of Macknight, Marsh and Moses Stuart admitted an evangelical import into the Old Testament Scriptures only so far as it has been actually discriminated and explained by the New Testament writers, in the instances which they have cited from the ritual and prophetical books. The German school of Hengstenberg and Olshausen, together with the Scottish school of Fairbairn and Bonar, reconstructing the whole Christology and Typology of Scripture, have looked for the Gospel in the Pentateuch, Christ in the Psalms, and the Church in the Prophets. And the Millennarian, literalistic school of Bickersteth, McNeile and Judge Joel Jones anticipate a still further and more miraculous fulfillment of the Old Testament in modern as well as ancient Judaism, by the restoration of the Jews to the Holy Land, the Second Advent of Christ as their political Messiah and their predominance with Him in a theocracy, to be established at Mt. Zion.

Finally, this supernaturalistic view has extended to the relations of ancient and modern Christianity. Nearly all existing Churches strive to connect themselves with the primitive Church of the apostles, but in different kinds and degrees of relationship. The Greek Church, claiming to be alone apostolic and catholic, treats both Romanism and Protestantism as heresies, while Mohamedanism is to be anathematized as

the bastard Christianity predicted under the name of the false prophet, the man of sin, the anti-Christ. The Roman Church, professing to have completed the Apostolic doctrine with the miracles and dogmas of her saints and fathers, denounces paganism as the anti-Christ, or mystical Babylon of the Apocalypse, and Protestantism as an incidental apostacy, like Arianism. The different Protestant Churches, maintaining the Reformation to have been a revival of primitive Christianity, have usually stigmatized Catholicism as the anti-Christ, and classed Mohamedanism with Paganism. It has, indeed, been a cherished opinion of some large-minded scholars, such as Neander, Ullmann and Schaff, that Catholicism and Protestantism are to be reunited in an ideal future Church, which will complete a series of divine dispensations, foreshadowed in the apostolic age, by the respective characters of Peter, Paul and John. But the more literalistic sects of Swedenborg, Irving and Cumming, regarding all existing forms of Christianity as corrupt or imperfect, are looking for the speedy establishment of the New Jerusalem of the Apocalypse, with apostolic gifts and powers, the miraculous conversion of Judaism, the violent destruction of Mohamedanism and Paganism, and the universal reign of Messiah and the saints on the scene of a renovated earth. And thus it has become, in one form or another, a prevailing conviction, that the history of Christianity is a supernatural career of triumph over all other religions.

According to the other hypothesis, however, the historical development of religion is a purely natural process, regulated by invariable laws. And it has always found some advocates, especially in times of decaying faith. The Egyptians, and after them the Greeks and Latins, were accustomed to associate epochs of innocence and depravity with great astronomical periods, marked by terrestrial catastrophes, such as universal deluges and conflagrations, which had been used by the gods as the means of punishing and renewing the human race. Amid the declining mythologies of the ancient world, it was the infidel policy of Celsus and Porphyry to confound the Christian with the Platonic Logos as a purely rational conception, and to class the miracles and prophecies with heathen oracles and feats of magic as mere natural manifes-

tations of human credulity. Even in the middle ages of faith, bold thinkers such as Raymond Lully, Arnold of Villanova, and Roger Bacon had begun to anticipate the millennium as a gradual achievement of Providence through the progress of science. At the revival of learning Pomponatius, Cardan and Vanini, renewing the classic myth of the golden and iron ages, endeavored to connect the rise and fall of religions with astrological periods or great sidereal conjunctions which were attended, as they maintained, with prodigies, prophecies and messiahs, producing universal consternation and faith only to be replaced by doubt and unbelief as the age of miracles passed away. And though the Reformation brought with it new supernaturalistic conceptions of Christianity, yet it was not long before these began to give place to more scientific speculations.

It was at first attempted to refer a supposed natural growth and decline of religion to laws of political development. Machiavelli had included epochs of religious credulity and infidelity in his vast social cycles of democracy and monarchy, simplicity and luxury, probity and corruption; maintaining that Roman Christianity itself was but a repetition of Roman Polytheism, and even an enfeebled repetition, because of its enjoined denial of those passions of honor, valor and ambition which had been the impulsive forces of the previous pagan civilization. Campanella, also associating an increase and decrease of faith with the rise and fall of empire, represented all religions as passing through grand astronomical cycles between the extremes of theocracy and democracy, papacy and atheism; now disorganized by heresies and schisms, then reorganized by new revelations and dogmas, as in the successive conflicts of Judaism, Christianity, and Mohammedanism, and in the alternate orthodoxies and heresies of paganism. Boullanger traced similar revolutions from a primitive theocracy toward an ultimate monarchy or sovereignty of reason. Vico, in a more inductive spirit, completed such speculations by collating religious similarities in the civil history of different nations, and exhibiting Christian as well as pagan civilizations careering through the same cycles of faith and doubt toward a final republic of piety and justice.

It was also attempted, in the same scientific spirit, to connect the history of religion with laws of intellectual development. Turgot, secularizing the universal history of Bossuet, had associated Christianity with the advancement of the human mind; and Condorcet had even sketched a career of science as gradually outgrowing religion. Hume, too, had traced the natural history of religion, from polytheism to monotheism, under the action of the imaginative and speculative faculties of mankind. St. Simon, completing such views, then connected the religious progress of the race with his great intellectual epochs of social synthesis and analysis, organization and disorganization, as seen at first in ancient polytheism and infidelity, and then in modern Catholicism and Protestantism, and about to appear again in a New Christianity of which he announced himself as the Messiah in a treatise dedicated to the Pope. Buchez, in his Science of History, endeavored to connect the social logic of St. Simon with the successive revelations to Adam, to Abraham, to Moses and to Christ as completed by the dogmas of the Gallican Church. Pierre Leroux, with more metaphysical subtlety, strove to resolve ancient Judaism and modern Christianity into St. Simonism as a sort of pantheistic religion of humanity, based upon social equality and involving the perpetual metempsychosis of the individual in the race. And Auguste Comte, as if combining the ideas of his predecessors from Campanella to St. Simon, represented theology as emerging from a primitive fetichism, through the classic polytheism, into the Catholic monotheism of the middle ages, only then to become decomposed by Protestantism, Deism, Atheism, and thus make way for the positivist or purely scientific religion of the future.

It has still further been attempted to subject Christianity itself to supposed laws of religious or Providential development. Bishop Butler, reasoning from the analogy of religion and nature, long ago with equal boldness and caution, had put forth the magnificent conjecture, that the whole Christian scheme from the beginning of the world, with all its miraculous phenomena, in the view of higher intelligences, may appear as much a natural process regulated by general

laws as the march of the seasons or the history of a flower. Lessing, too, had represented the successive revelations of Judaism and Christianity as only educating the human race by developing in history what existed potentially in the reason of mankind. And Kant, Fichte and Schelling had severally maintained that revealed religion is essentially identical with rational religion, that its contents may be rationally prejudged or criticised *a priori*, and that it is itself only a higher stage in the development of the mythologies or natural religions of the world. Carl Ludwig Nitzsch, on the basis of the Kantian rationalism, in a treatise upon the "Difference between an Authoritative and a Didactive Revelation," then argued that the only design of Christianity was to awaken and enlarge the latent truths of natural religions by means of its prophets and apostles. William Traugott Krug, also a disciple of Kant, and his successor at Königsberg, in some Letters on the Perfectibility of Revealed Religion, taking the ground that a perfect or absolute religion could not be revealed all at once to imperfect and finite minds, maintained that the object of Christ and His apostles was simply to premise the elements of such a religion and start the race upon a career towards it. Christoph Von Ammon, court preacher at Dresden, in his work on the "Development of Christianity towards a Universal Religion," held that as Christianity superseded Judaism by a more spiritual system, so each generation should expect to advance beyond the traditions of its predecessor into ever higher stages of religious knowledge and wisdom. Hegel also taught that the absolute religion contained in the Christian images and doctrines, having been dimly foreseen in the early Church, only reached its full apprehension through the dialectic process of his own philosophy. Zeller, in a "Critical and Historical Essay on the Perfectibility of Christianity," has pointed out the affinity of such views with those of the early and mediæval millennarians, who looked for new dispensations and revelations, as well as those of modern sociologists, who include Christianity with other interests under great laws of human development and perfectibility.

At length, by a new school of historical research, attempts

are made to construct a so-called comparative theology or inductive science of religions. Some Christian apologists, such as Trench, Maurice, J. Freeman Clarke, may have unknowingly taken a step in this direction by exhibiting ancient and modern heathenism as a brilliant though distorted and fragmentary reflection of the peculiar truths of that Judaism and Christianity with which they co-existed; by exalting the spiritual affinities as well as historical connections between pagan and revealed religions; and by representing them as conspiring and converging toward some absolute and universal religion of the future. Professor Moffat also, in his "Comparative History of Religions," though insisting upon the revealed origin of Judaism and its supernatural completion in Christianity, describes a natural progress of all religions by alternate revolutions and reformations, as from Noachism to Confucianism, from Brahminism to Budhism, from Catholicism to Protestantism. But the honor of proposing a distinct science of religions seems to belong to Professor Max Müller, who suggested that it should be constructed by a process like that of comparative philology, and should include Christianity among other religions; as being indeed a standard toward which in various degrees they have approximated, and yet itself also destined to decline and leave to philosophic religionists the task of reconstructing some more perfect successor. The Westminster Review, while agreeing with the Oxford Professor in the main, doubts if the new science is to be sought among the uncorrupted teachings of ancient religions at this mature age of the world. M. Émile Burnouf, in his treatise upon the subject, claims to have already founded such a science of religions upon the sciences of comparative ethnology, philology, and archæology; maintaining that the Aryan races were pantheistic, and the Semitic races monotheistic; that both elements have commingled in Judaism and Christianity, and that all religious creeds, with their issuing cults, succeed each other under fixed laws of differentiation, conflict and survival, by which great orthodoxies wax and wane as inevitably as a germ grows and dies or a wave rises and falls in the sea.

As to the third problem, the destiny of religion, two oppo-

site opinions are also emerging. According to one of them, all other religions are destined to be supplanted by Christianity as the one absolute religion of the future. The apostles themselves proclaimed it as a gospel for Jew and Gentile, for barbarian as well as Greek and Roman; and the Chiliast fathers looked for its immediate forcible triumph over the surrounding paganism by a second coming of Christ in judgment. The subsequent missionary labors of Augustine in England, Boniface in Germany, and Siegfried in Sweden, proceeded more in the spirit of ecclesiastical propagandism. It seems to have been the policy of the imperial Church, under Charlemagne, to conquer as well as convert the Scandinavian religions with which it came in conflict, subduing them first by warlike prowess and then by spectacular worship. The great crusades of the mediæval theocracy were but the effort of Europe to supplant Mahomedanism by the sword. Roger Bacon even proposed to the Pope to burn the cities of the Mussulmans by the focal rays of incendiary mirrors. Raymond Lully would have overthrown them dialectically with his great art of logic. At a later period, Campanella revived the theocratic dream of Hildebrand in a treatise on universal papacy, styled the "Monarchy of Messiah," and endeavored to persuade the king of Spain to begin a series of wars for the extirpation of Protestantism throughout Europe, as well as the maintenance of Catholicism by the Spanish conquests in America, Asia and Africa. But the Jesuit Propaganda sought to repair the losses of the hierarchy in a more efficient manner, with its polyglot press and net-work of missions in all parts of the world. During the present century, the great Protestant Churches also have been engaging in organized efforts for the universal proclamation of the gospel in heathen lands. And at length such aims, with the growth of commerce, diplomacy and philanthropy, have begun to assume a color of scientific prevision as well as of practical success.

The triumph of Christianity over the different forms of modern heathenism is already thus anticipated as an event in the near future. It is argued that the Christian religion, as now maintained by the leading nations of Europe and America, is not only accompanied with a higher civilization, with

more political, intellectual and moral power than the semi-barbarous and savage religions of Asia and Africa, but contains within itself elements of truth, vitality and permanence before which they, in their weakness and decrepitude must, sooner or later, succumb and die out, as did the Grecian, Roman and Scandinavian mythologies, which it encountered in its earlier career. Confucianism, according to Neumann, McClatchie and other Chinese scholars, cited by Hardwick, has long since degenerated from the pure monotheism of Noah into a system of mere atheistic state-craft and utilitarian ethics which, having been checked by Budhism, must inevitably wane before the advance of Christianity, as propagated by the missionaries and already espoused by the leaders of the great native rebellion. Brahminism, according to the learned William Jones, Wuttke and Wilson, has long since declined into mere dreamy pantheism among the priesthood, with the grossest polytheism among the populace, and though it has survived its conflicts with Budhism and Mohamedanism, yet it is not so likely to withstand that Christian civilization with which it is fast becoming permeated. Budhism remains as the most formidable rival of Christianity, embracing, perhaps, as many millions of the human race in different countries, and yet, according to the testimony of Gutzlaff, Rémusat and Huc it was in its origin little more than a species of negative Protestantism against Brahminism, and has already waned into a hopeless nihilism, ready for a more positive Christian faith as its proper complement. As to the polytheism and fetichism of Africa, America and Oceanica, all travelers and missionaries agree in representing them as degraded forms of the grossest nature-worship and devil-worship, which can offer no intellectual obstacle to a purer creed.

The triumph of Christianity over modern Judaism and Mohametanism is also predicted from similar data and reasonings. It is maintained that these systems are at best mere dead traditions and arrested growths, which were sloughed off and left to perish, like the defunct religions of ancient Egypt and Persia, that for a time accompanied the early progress of revelation. Judaism, having long since discharged its preparatory mission, is regarded by all Christian writers as

an anachronism in the modern world, a form of dormant legalism, which can only be quickened into evangelical life by the conversion of the Jews to Jesus as their only true Messiah, and possibly their return to the Holy Land at His Second Advent. Mahometanism, according to such authorities as Weil, Sprenger and Palgrave, can only be viewed as a great relapse from Christianity toward Judaism, a species of sensual fatalism fast becoming effete and corrupt through its own fiery passions. And Mormonism, that grotesque mixture of all three religions, is only cited as an anomalous blot upon our Christian civilization.

Finally, the triumph of Christianity over all antichristian heresy and infidelity is not less confidently expected as its last achievement. It is claimed by all Churches that the one true faith will yet come out victorious over error, as in former conflicts with schismatics and sceptics. Catholic writers regard Protestantism as a mere incidental heresy, of no greater significance in the onward march of the Church than the Arianism of the fourth century. Protestant writers look upon Catholicism as a vast apostasy of the dark ages, from which the whole Church is now recovering with primitive power and fervor. And both Catholics and Protestants unite in classing the infidel sciolists of the day with the Italian naturalists, the English deists, the French atheists and the German pantheists, as foes to be certainly vanquished. Thus it appears that, in one way or another, all Christians are looking forward to a time when Christianity shall have extirpated every other form of religion.

According to the rival hypothesis, however, Christianity is itself destined to be supplanted, together with other religions, by some new absolute religion of the future. From the first, its exclusive claims were resisted by Judaism with a bitterness that lingers to this hour. Its march through the Roman empire toward universality was disputed by the different forms of paganism, which sought to extinguish it with persecutions, and by the eclectic infidelity which would have merged both it and them in a new catholic creed of reason. The rude religions of the North, when converted by it, mingled fierce barbaric virtues with its gentle graces. Mohamedanism, with a

resistless proselytism of the sword, seemed to have conquered its very shrine and wrested away half its empire. Its ever-asserted catholicity, repelled from Asia and Africa, and apparently rent in twain throughout Europe by means of the great schism between the Eastern and Western Churches, has since been repeatedly broken by intestine wars, and at length pulverized into the countless sects of Protestantism. And that infidelity which, meanwhile, has grown up through an abuse of its very light and freedom, after contending with it successively in Italy, England, France, Germany and America, seems now preparing to formulate the terms of its surrender and downfall.

It was at first claimed that the new absolute religion of the future will grow out of revealed religion, historically, as Christianity itself has grown out of Judaism. The early and mediæval millennarians having made the general idea of such a final religion familiar, it has only remained for modern sociologists to construct its creed, polity and worship out of the existing Christian civilization. The New Christianity of St. Simon is simply a proposed reorganization of the State upon the principles of the Church, such as charity, fraternity and equality, with the addition of scientific and economical provisions for the eradication of slavery, war, caste and poverty. Leroux, besides maintaining the historical connection of St. Simonism with Christianity, resolved revelation into reminiscence and presentiment, and identified the future life with the present state, the individual with the race, God with man, and heaven with earth; in a word, made the new religion to consist in mere humanity. Comte completed it with his Positivist catechism, calendar and ritual, designed for the worship and commemoration of heroes, sages and philanthropists, and modelled upon the forms of Catholicism. Instead of looking for such a renovated Christianity, however, Dr. Phillipson, consistently with his hereditary creed, projected a fulfilled Judaism or Messianism as the final religion, on account of its containing that essential monotheism which had become corrupted by the followers of Christ and Mahomet. Islamism, too, by James Freeman Clarke, has been classed with Christianity and Judaism as one of the three catholic

monotheisms or unitarian religions which alone dispute for supremacy and universality over all nations and races. And the pantheistic apologists of Brahminism find in it the elements of a universal creed, which is to survive the decay of all other religions.

It is also claimed that the new absolute and universal religion will issue from a coalescence of Christianity with other natural religions, as Judaism has preserved and assimilated the residual truths of the Egyptian and Persian mythologies, only to become itself combined with those of the Grecian and Roman systems. The English and German deists having elaborated the conception of such an essential universal faith common to all nations, some comparative theologians are already endeavoring to define it by collating Christian with heathen forms of religion as objects of scientific study. Max Müller proposes to call it Theoretic Theology, in distinction from that Comparative Theology by which it is to be sustained and illustrated, and would derive its elements from the primitive uncorrupted teachings of the great founders of the ancient religions. Theodore Parker states its problem to be, by means of the human faculties, to gather from Catholic and Protestant, Jew and Gentile, Buddhist, Brahmin and Mohamedan, a whole of theological truth, an absolute religion, founded upon nature and common to all men. Mr. Wentworth Higginson, in a lecture on the Sympathy of Religions, argues that all races already agree in the chief articles of natural theology, such as the being of a God, the immortality of the soul and the brotherhood of man. Mr. Samuel Johnson, in his work on Oriental Religions, suggests that the oldest religions may have an important function in purifying that theism still irreverently denounced as infidelity; that the mission of Christianity to the heathen is as much for the modification of its own religious peculiarities as theirs; and that the change from distinctive Christianity to Universal Religion is a revolution, compared with which the passage from Judaism to Christianity itself was trivial. It is claimed by Miss Frances Power Cobbe that the mass of converted Indian youth are becoming mere theists; and the Hindu philosopher, Keshub Chunder Sen, has established relations with English and American

deists, with the view of propagating such a faith as the future common religion of all nations.

At length, to such historical researches and comparative studies have been added still more speculative attempts to project the new absolute religion, such as were made by the Neo-platonists, who sought to extract an eclectic creed from the fusion of Christian with Pagan doctrines in their day. The German idealists, from Fichte to Hegel, having striven to sublimate religion into philosophy, it has been but a step further to evaporate Christianity into mythology, and retain only such residual ideas as are likely to survive the disintegration of all existing religious systems. Accordingly some advanced writers of the school are already propounding this philosophic faith of posterity. Mr. W. R. Greg, in his Creed of Christendom, after urging that there is no such thing as a revealed religion which cannot be tested by reason, proposes to sift the truth from the error of the Scriptures by a species of Christian Eclecticism, the elements of which he delineates. Dr. Strauss, in his final work on the "Old Faith and the New," having shown that we are no longer Christians, and that a religion, in the ordinary sense, is scarcely now possible, would substitute for it the conception of a law-governed cosmos, developing without a Creator, yet full of life and reason, and to be treated as devoutly as if it were a deity. Emile Burnouf seems to infer, from the history of all religions, that the common germ and essence of all of them is neither an original revelation, nor a barbaric superstition, but a metaphysical theory of the world, which it is the mission of science to demonstrate through its conflict with religion. And Edward Hartmann, in a recent treatise, styled the Disintegration of Christianity and the Religion of the Future, has argued, from the unchristian and irreligious tendencies of liberal Protestantism, to the necessity and possibility of some new universal religion, which shall exhibit the synthesis of oriental and occidental pantheism as the one catholic, philosophic faith of mankind.

In practical illustration of these extreme views we now have a remarkable attempt to subordinate, if not to supersede, Christianity by means of Buddhism or Brahminism. Mr. Edwin Arnold, in his romantic poem, "The Light of Asia;"

Mr. F. Marion Crawford, in his ingenious "Tale of Modern India;" Mr. A. P. Sinnett, an English resident at Simla, in his two curious volumes, "The Occult World" and "Esoteric Buddhism;" and above all, Madame Blavatsky, a Russian lady of high rank, in her voluminous treatise, entitled "Isis Unveiled," have made us acquainted with a theosophic order which has its shrine in Thibet, and endows the adept, especially the accepted high-priestess, with thaumaturgic powers before which the miracles of early Christianity, as well as the marvels of western science, must pale into insignificance.

The rational section of theology thus presents bewildering stores of archæological, mythological and hagiographical information concerning the various religions of the world, with vague surmises and crude conjectures as to their origin, growth and destiny. These materials are being collected in the voluminous "Sacred Books of the East," edited by Max Müller, in a similar series of the "Principal Religions" issued at Harlem, as well as in numerous special treatises by De Tassy, Beaudissin, Horug, Hardy, Lane-Poole, Hauri, Scholl, Lippert. They have been brought under discussion in the Hibbert lectureship, by Renouf, Beard, Sayce, Kuenen, Réville, and are more or less rigorously treated by scientists and amateurs, Huxley, Conway, Renan. Prof. C. J. Tiele, in his "History of Religion," prefers the name Hierology to Science of Religions, classifies them as natural and ethical, and traces the rise of national into universal faiths. Prof. De la Saussaye, in his "History of Religions," discusses thoroughly their phenomenology, ethnography and history. Von Hartmann, in his "History of their Gradual Development," grades them as naturalistic and supernaturalistic, beginning with supposed animal religions. Dr. Hermann Preiss, in his "History of the Religious Consciousness," traces their evolution from their lowest natural to their highest psychical forms.

Upon the basis of such data some writers have begun to speculate. Mr. Charles P. Stone finds "Christianity before Christ" in India as the cradle of creeds, no less than of the arts, affording prototypes of the same doctrine and culture in all religions. Mr. Arthur Lillie already discerns

"Buddhism in Christendom," and forecasts their fusion under English imperial rule into one common universal faith. But Count D'Alviella, professor of comparative theology at Brussels, maintains that the "Scientific Study of Religions" should discard the illusion of a primitive religion, and leave the enlightened partisans of all religions to shake hands with each other and with the pupils of science and friends of progress. It is plain that as yet it would be premature and misleading to attempt anything like a strict scientific correlation of non-Christian and Christian or rational and revealed religions.

On the revealed side of the same science, however, may be traced as great departures from the rational theory of religion. In the first stage there was the great Protestant effort to throw off a false scientific theology, the traditional dogmatism of the schools. It was the period when the pure word of God, free from patristic and scholastic comment, was being studied anew, and eager reformers were rejoicing in the full light of a restored divine revelation. Wickliff, Huss and Wessel had led the way as pioneers and proto-martyrs. Luther then appeared as the great popular leader of Protestantism, and by his translation of the Bible into the mother tongue, by his expositions, sermons and theses, by his hymns, controversies and epistles, and above all by his bold apostolic career, gave the movement an impetus which after three centuries is not yet spent. Philip Melancthon, the scholar of the Reformation, wrought into his "Outlines of Theology," the first compendium of the Protestant doctrines which had been drawn from the Scriptures as the common heritage of believers. John Calvin, the great constructive reformer, reduced them to a compact body of divinity in his famous "Institutes of the Christian Religion." At length Cranmer, the victorious martyr, and Knox, who never feared the face of man, imported them into the Churches of England and Scotland; the one incorporating them in the Book of Common Prayer, and the other in the Book of Common Order. And then followed the great Protestant, Reformed and Puritan divines of the ensuing and the present centuries,

together with their Catholic, Arminian and Socinian opponents, all endeavoring, in the light of modern thought and research, to recast the whole Scripture doctrine of God and divine things.

But meanwhile, in the next stage of separation, have still remained the old traditional dogmas concerning the verity, the peculiar doctrines and the final supremacy of Christianity, maintained without respect to the new science of comparative theology which has been struggling into light. As to the verity or sufficiency of Christianity, all orthodox Christians have concurred in treating it as the only true essential religion. Roman Catholics, by their definition of the Church, have virtually repudiated the distinction between natural and revealed religion, and excluded beyond the pale of salvation not merely heretics and infidels, but Jews, Turks, and all pagans and idolaters as followers of false religion. Protestants, while admitting the distinction between natural and revealed theology, have maintained the utter insufficiency of the former, and though generally conceding the salvability of infants, heathen as well as Christian, have nevertheless practically treated all other religions as worthless and their followers as in a state of perdition. At the same time there is a lack of intelligent agreement throughout the Christian world in regard to the exact relations of natural to revealed religion, of heathenism to Christianity, and the extent to which they may have had a common origin or may yet have an ultimate combination.

As to the peculiar doctrines of the Christian religion, the greatest diversity began to prevail at the Reformation. Roman Catholics at once reconstructed their theology, polemically, against Protestantism. The Council of Trent, repudiating the Reformation as a mere heresy, solemnly reaffirmed, by its canons and catechism, the whole mass of patristic and scholastic dogmas as containing the sum of religious knowledge; and this remained the faith of two-thirds of Christendom. Protestant divines, at the same time, proceeded to construct their theology, polemically, against Catholicism. The German churches, repudiating most of the scholastic and some of the patristic dogmas, retained simply the primitive, œcu-

menical symbols, the Apostles', Nicene and Athanasian creeds, in connection with the confessions, apologies and formularies of Luther and Melancthon, emphasizing the great doctrine of justification by faith; and portions of the same system found their way, through Martin Bucer, into the English Liturgy. Various Reformed divines soon constructed their theology, polemically, against Lutheranism, as well as Romanism, in the interest of Calvinism. The Synod of Geneva, repudiating the scholastic and most of the patristic dogmas, retained only the Apostles' Creed, in connection with the confessions of Calvin and Zwingle, emphasizing the cardinal doctrine of predestination; and substantially the same system passed, not only into the confessions of the French Churches, but, through Olevianus and Ursinus, into the catechism of the Dutch Church; through Cranmer and Ridley, into the articles of the English Church; through Knox, into those of the Scottish Church, and ultimately, through the Westminster Assembly, into the standards of the Congregational and Presbyterian Churches of the United States. In these different Churches, however, numerous sectarian divines soon followed, constructing their theology, schismatically, against other creeds, in the interest of some single denomination, congregation or person. In the Roman Catholic Church the Jesuits, under Loyola, and Port-royalists, under Jansen, renewed the battle of Protestantism within the walls. In the Lutheran and Reformed Churches the Anabaptists, under Menno, separated on the question of infant baptism. In the Church of Poland the Unitarians, under Socinus, rejected the dogma of the trinity. In the Church of Holland the Remonstrants, under Arminius, departed from the doctrine of predestination toward universalism. In the Church of England the Presbyterians, under Baxter, dissented from prelacy in favor of a reformed episcopacy and liturgy; the Congregationalists, under Nye, dissented from Presbytery in favor of local polity and worship; and the Quakers, under Fox, dissented from all Churches and rites, in favor of mere inner light and rapture. And in the Churches of the United States, these different sectaries have simply reappeared, sowing broadcast the dragons' teeth of a new brood of heresies, embracing the additional varieties of Methodists and Baptists, and

ranging between the gross Judaism of Mormon and the crude Christianism of Campbell. In a word, for three centuries, throughout Christendom countless sects, following their different leaders, have gone on protesting against Protestantism, reforming the Reformation, purifying Puritanism, dissenting from Dissent, and redividing after each new division, down to the very dust and powder of individuality itself.

As to the final supremacy of Christianity, there is more apparent agreement, with differences mainly as to the means employed. Roman Catholics, consistently with their system, anticipate the future destruction of all false religion through the Jesuit propagandism in Heathendom and the aggrandizement of the papal hierarchy in Christendom. Protestants also look for the predicted disappearance of all anti-Christian error and superstition; some anticipating it as a spiritual triumph of Christianity, effected by divine Providence, in the progress of missions and civilization, and others maintaining that it will be the result of vast political and planetary judgments attending the miraculous return and reign of Christ in a new impending dispensation.

The revealed section of theology is thus found to contain a vast medley of Christian creeds and dogmatic systems, together with a mass of forming opinions concerning the relations of Christianity to other religions, as the one primitive and final religion of the world. The creeds and systems, after three centuries of division and controversy, begin to show signs of unification not only in our country but throughout the Christian world. In some recent papers on "The United Churches of the United States," the writer has traced the existing grounds or germs of their organic unity, as seen in their consentient formularies of doctrine, their congruous systems of polity, and their assimilating modes of worship. On such latent grounds of affinity, for some time past, the chief denominations have been moving together, practically if unconsciously, towards true church unity as distinguished from mere denominational coöperation. And at length four terms of such unity have been formally proposed by the House of Bishops of the Protestant Episcopal Church; the Holy Scriptures, the Nicene Creed,

the Two Sacraments, and the Historic Episcopate. These terms are already under formal consideration in other Protestant churches, and have also been adopted and re-affirmed by the last Pan-Anglican Conference. If to such movements be added others looking toward the re-union of Anglo-Saxon with Greek and Latin Christianity, it will be seen that the conditions are at least not unfavorable to some ultimate agreement of all Christian churches in essential Christianity.

At the same time, there has come a no less remarkable movement towards the consensus of Christianity with other religions through the reactionary influence of foreign missions. In the work of propagating the gospel in heathen lands, it has been found necessary to study ancient faiths which date before the Christian era and claim to have sacred scriptures, miracles and saints, rivalling those of the Christian Church. A vast fund of religious knowledge is thus accumulating, not only in divinity schools and mission colleges, but in special works by learned missionaries on the different religions, as by Williams, Vaughn, Davids, Ballantyne, Beal on Hinduism; by Edkins, Martyn, Douglas, Legge, Culbertson on Chinese religions; by Wherry, Weil, Arnold, Bate, Dods on Islamism, besides general treatises by Rawlinson, Döllinger, DeBroglie, Spiess. Among American writers the Rev. John P. Lundy, in his elaborate treatise on "Monumental Christianity," by an artistic interpretation of the symbols of all religions, has sought to trace their unity to a primitive revelation, perverted in Paganism, developed in Judaism, and matured in the Articles of the Apostles' Creed, which he finds successively displayed in the paintings, sculptures, tombs, personal ornaments and other monuments of the Christian Church. Dr. Richard S. Storrs has collected the "Historical Evidences of Christianity," after having discoursed eloquently on its final supremacy in the earth. President Woolsey, in his treatise on the "Religion of the Future," has vindicated the superiority of Christianity and its capacity to survive and finally triumph over all other religions.

Although this literature is gathered from apologetic rather than scientific motives, with the view of exhibiting the dissensus rather than the consensus of Christianity among

heathen systems, yet it cannot but have an indirect bearing upon the problem of an absolute or universal religion as put forth by the comparative mythologists from the empirical side of the science. For already theology as an empirical science of natural religion is coming face to face with theology as a metaphysical science of revealed religion. They are meeting on the summit of the other sciences as at once the last of their empirical and the highest of their metaphysical series. Sooner or later they must come into some logical correlation on common philosophic ground. Of this issue their respective advocates are becoming conscious. At present, however, only the data and terms of the problem can here be stated.

On the one side, while comparative theologians, like Max Müller, may decline as yet to accept Christianity as the only revealed religion and class its Holy Scriptures scientifically with the sacred Books of Brahminism, Zoroasterism, Taouism, Buddhism, and Mohammedanism, yet the more profound members of that school see plainly that all religions are metaphysical as well as empirical and that the question of one absolute religion cannot be treated as a mere problem of empirical science, precluding the very idea as well as the fact of a divine revelation; but must also and mainly be treated as a problem of metaphysic science, admitting at least the possibility of such a revelation. Even Burnouf, though he denies a primitive revelation, claims that the common germ and essence of all historic religions is a certain metaphysical theory of the world; and if metaphysical it may be also theistic and revealed. Lord Amberley in his "Analysis of Religious Belief," has discovered the one essential truth of all religions in their universal recognition of some mysterious unknown Cause of the universe, which they have variously symbolized and personified. As we have seen, the Boston school of Clarke, Higginson, and Johnson, find deism or theism to be the essence of all religions. Count D'Alviella, in his latest work "The Contemporary Evolution of Religious Thought in England, America, and India," has maintained with great learning and acuteness that there is a universal tendency to recognize one Supreme Reality, which is revealed in consciousness but transcends definition; to which we are

linked by a sense of dependence and duty and the hope of immortality; and which acts by fixed laws, possibly toward some final cause of nature. It is obvious that the new science of religions, like other sciences, is already abutting upon metaphysic problems, and among them may yet be found the perennial problem of a revelation.

On the other side, in like manner, the professed metaphysicians, with some enlightened divines, hold their old philosophic ground as to these problems. Indeed, the "Philosophy of Religion" has long been a recognized pursuit in the schools of Germany, where it has often been viewed as more or less congruous with revealed theology. Dr. Otto Pfleiderer thus treats directly of "The Philosophy of Religion on the basis of its History," elaborating fully the religious speculations broached by Kant, Hegel, Fichte, Schelling, Schopenhauer, Feuerbach, from the standpoint of their respective philosophies. Professor Halsten, in his treatise on the "Origin and Essence of Religion," as a disciple of Schleiermacher, traces its historic development from fetichism, through mythology and theology, into the realm of pure philosophy. Dr. Bernhard Pünger designed his unfinished work on "The History of the Christian Philosophy of Religion" as a basis on which to maintain the identity of the metaphysical with the religious theism. Lotze has sketched "Outlines of a Philosophy of Religion" in which the Absolute appears as the one Perfect Personality consistent with personality in man and teleology in nature. So-called Philosophies of Christianity have been attempted by Köppen and Weisse. Such speculations have even begun to show themselves in the sober guise of Scottish metaphysics. Principal Tulloch, commenting upon an essay of Professor von Hamel having the suggestive title "Religion without Metaphysic," has ably shown the futility of applying the empirical methods of the evolutionary school of ethics to a problem so recondite. Principal Fairbairn also dwells upon the poverty and hopeless inadequacy of the anthropological theories of the origin and nature of religion which are now so fashionable; and in his own "Philosophy of Religion" has endeavored to expose the metaphysical bases of the whole

doctrine of theism and revelation. Professor Flint earnestly commends the same study to our younger divines, as the very crown and goal of theological science, rather than a menacing form of infidel speculation. Principal Caird, of Glasgow, has not only discussed profoundly the Philosophy of Religion, but also connected it with the History of Religion, maintaining that the organic development of Christianity in connection with the essential truths of Heathenism can only involve its own vindication and growing predominance. More or less consciously, indeed, this theory has always been pursued from the time that Justin and Clement displayed the consensus of Christianity with the ancient pagan religions. And it is not easy to see how the manifestation of its consensus with modern heathen religions could have any other effect than to exalt it as the one supreme revelation of which they are but innate germs or traditional fragments.

From both sides of the science, its empirical and metaphysical portions are thus entering a process of mutual attrition and correction, which is likely to issue in the gradual fusion of all religions into Christianity as the one absolute religion for mankind.

In concluding our survey of theology, both rational and revealed, we should observe that as yet we have noticed only its superficial material, what might be termed its phenomenology, the hypotheses and dogmas which it presents, and have scarcely touched those profound problems of theism and revelation which connect it properly with metaphysic and philosophic science as hereafter to be treated.

Having now surveyed the sciences, we may next look for a theory of their evolution. Logically this order might be reversed; but practically we cannot begin with the results of unknown processes. It is but a truism to say that we must have the sciences before we could have a science of the sciences. And the former lead us to the latter. Trendelenberg, in his "Logical Investigations," has said that the special sciences point to a universal science or theory of knowing and being. Professor Wilhelm Wundt at the close of his great work on "Logic" very justly remarks that philosophy

is neither a mere undertaker of the finished sciences, nor a precursor of all possible sciences, but simply a general science finding its data in the methods and results of the special sciences and requiring their full delineation for its own completion. The foregoing delineation of them, it will be seen, refers not so much to their logical methods and results as to their cognitive provinces and contents; but however meagre it may be as respects the logic of the sciences, it will at least afford materials for that theory of the sciences upon which such logic must hereafter proceed, even in all time to come. And therefore the theory will claim our attention in the next chapter before we pass to the logic as projected in the second part of the treatise.

CHAPTER III.

THE SCIENCE OF THE SCIENCES.

ACCORDING to the original project of this work, the Science of the Sciences includes a theory or doctrine in three parts; first, a doctrine of the cognitive or the means of cognition, both reason and revelation; second, a doctrine of the cognizable or the material of cognition, both as discoverable and as revealable; third, a doctrine of the cognitive in action upon the cognizable or the joint cognitive process of reason and revelation throughout the ascertained realms of empirical and metaphysical inquiry.

Similiar outlines in part, though with very different contents, have been sketched by Professor Wundt, of Leipsic, whose comprehensive and elaborate "Classification of the Sciences" appears in the current volume of the *Philosophical Studies*. After schematizing the special sciences in two groups as formal and real, the first including the mathematical sciences and the second the various physical and psychical sciences, he projects the general or philosophical sciences also in two groups as embracing a doctrine of cognition, both formal and real, the latter including the history and the theory of science; and a doctrine of principles, both general and special metaphysics, the latter including the philosophies of nature and of mind. Under the last caption, at length appears the philosophy of religion; systematic theology having previously been put among the special sciences. One of the distinguishing merits of this scheme is the prominence given to the philosophical sciences, as compared with their neglect outside of Germany; but there is no adequate place allowed among them either for a theory of revelation or for

the body of revealed knowledge, considered in a strictly philosophical light. And this is a defect which it shares with nearly all other modern schemes of philosophic science.

Mr. Shadworth H. Hodgson, the most advanced English thinker upon these subjects, in his sumptuous volumes on "The Philosophy of Reflection," has acutely distinguished philosophy from the special sciences as a higher science concerned not merely with their evolution and organization, but also with a metaphysic which they involve and an ontology to which they tend. In opposition to English philosophy he allows a large place to metaphysic, whilst in opposition to German philosophy he connects metaphysic with psychology and detaches it from ontology, so far as that is beyond consciousness. In other words, his contention is, that the problem of knowing includes the problem of being, but excludes the problem of revelation, as involving pseudo-philosophical or anti-philosophical assumptions concerning what lies behind the impenetrable veil of absolute and incognizable existence.

As we proceed it will be found that a science of the sciences must involve in its logical structure not only a theory of knowledge and a theory of being, but also a theory of revelation as consequent and complemental to the other two theories. And these theories are to be formed as all science is formed, inductively and experimentally; not by any one mind evolving them from its own consciousness as sheer speculations, but by many collective minds through many generations, framing and testing one hypothesis after another, in the progress of research and of thought; that is to say, in the history of philosophy as the general science or science of sciences. Moreover, philosophy in attaining these three theories will accomplish her three traditional aims, as a science of knowledge, as a science of being, and as a science of things divine and human.

These three departments of universal science may be characterized severally as *philosophic*, *metaphysic*, and *theosophic*; and it will be convenient here to treat them in the order named, although logically they so overlap and involve one another that it is not easy to separate them.

SECTION I.

Philosophic Science.

Philosophic science has been variously termed Epistemology, the science of science; Gnosiology, the science of knowledge; and Noetic, the doctrine of cognition. Each leading nation has also in its language some similar term or phrase, such as the French and English "Philosophy of Science," the Italian "Genesis of the Knowable," the German "Theory of Cognition," expressive of a common object of their aims and efforts. Moreover, the modern history of such philosophic science shows in both its rational and revealed sections the same logical and chronological stages which we have traced in each of the special sciences; and we shall therefore pursue the same method in surveying its contents.

In the rational province of philosophic science, may be traced a gradual severance of reason from revelation as the chief source of divine knowledge. During the first of the three stages came the legitimate rise of free thought against a false revelation, against the pretended infallible teaching of the Roman Church. It was the time when the human intellect was breaking from the shackles of priestly authority, and asserting its claim to the whole domain of research. As early as the fourteenth century Roger Bacon, the prophet and proto-martyr of Christian philosophy, had issued his "Great Work on the Unity of the Sciences," projecting a chart of all future knowledge, quite ahead of his age, and exposing the existing causes of human ignorance, such as authority, custom, prejudice and conceit, only himself to fall a victim to their malignity. Marsilio Ficino, the scholar of the classical revival, with the help of the Greek Pletho and Cardinal Bessarion and under the patronage of the Medici, had introduced from Constantinople, through the Florentine Academy into Western Europe, that elegant literature which was destined to become the chief instrument of modern philosophical culture. Theophrastus Paracelsus, as the pioneer of philosophical mysticism, had claimed that faculty of universal insight, which was yet to find its bloom in Swedenborg.

Michel Montaigne, as the pioneer of philosophical scepticism, had raised that spirit of universal doubt, which was yet to come to its crisis in Hume. Pierre La Ramée, the logical iconoclast, had assailed the idolatry of Aristotle, with his "New Dialectic," and led the way to that more natural process of reason which the later logic has matured. Thomas Campanella, the immediate forerunner of Bacon, had already issued his "Precursor of Restored Philosophy," boldly summoning his age from the logomachy of the schools to the fresh study of nature. Francis Bacon, the father of modern empiricism, in his "Great Restoration of the Sciences," then dealt the fatal blows at those illusive prejudices in the race, in the individual, in common life, and among the learned, the idols of the Tribe, the Den, the Market and the Theatre, which had so long been obstructing the advance of knowledge; and at the same time, with his new logic, prescribed the method of that natural philosophy which Copernicus, Galileo, and Kepler were already practicing. René Descartes, the father of modern transcendentalism, soon following with his "Discourse on the Right Conduct of Reason in the Sciences," premised the mental and moral rules of all sound investigation: and, with self-consciousness as his only guide, entered the realms of metaphysical philosophy, followed by Malebranche, Spinoza and Leibnitz. Jean D'Alembert, the first modern encyclopædist of the physical sciences, organized them in the celebrated French Dictionary, according to the classification of Bacon, and lucidly discussed their order, method and connection, as unfolded by the great leaders who have successively seized and transmitted the torch of knowledge. Christian Wolfe, the first modern encyclopædist of the metaphysical sciences, systematized the fragmentary teachings of Leibnitz, and formulated the abstruse problems of ontology, cosmology and psychology, which had been passing, unsolved, through the schools. Thomas Reid, the protestant of common sense, now recalled philosophy for a moment from the vagaries into which it had been led by Berkeley and Hume. Immanuel Kant, the unrivalled critic of human reason, then achieved a Copernican revolution in philosophy, by supposing that the mind moulds the world, as well as the world the

mind in the process of knowledge, and thus started that two-fold movement which has issued in the idealism of Fichte, Schelling and Hegel, and the realism of Herbart, Beneke and Lotze. George Wilhelm Friedrich Hegel, the most subtle spirit of our epoch, at the summit of the idealistic movement, projected his magnificent "Encyclopædia of the Philosophical Sciences," embracing Logic, Nature and Spirit, Art, Religion and Philosophy, in one consummate system of absolute knowledge. Aguste Comte, the modern Bacon, at the opposite extreme of empiricism, attempted a similar "Philosophy of the Positive Sciences," reducing them to an historic series, and announcing their methods, limits and laws. And more recently hosts of other great thinkers of various schools, such as Cousin, Littré and Janet, Mill, Lewes and Spencer, Ferrier, Calderwood and Fraser, Hickok, Seelye and Krauth, Trendelenberg, Ueberweg and Ulrici, Hodgson, Stirling and Green, from their respective standpoints have been pouring forth the most abundant materials for that one ultimate philosophy or science of sciences, which is yet to be collected out of the sciences themselves, considered as intellectual phenomena, subject to logical and historical laws.

Meanwhile, however, the next stage of departure appeared thronged with mere speculative philosophers, utterly ignoring that true revealed knowledge which still remained unimpeached. These philosophers, instead of the doctrines of the inspiration, illumination and fulfilment of Scripture, substituted their various conflicting hypotheses concerning the origin, the method, and the goal of science or true philosophical knowledge.

Realism and Idealism.

As to the first problem, the origin of science, there arose the two rival schools of idealists and realists. According to the former, our knowledge embraces mere ideas. And the opinion was one which had been long and widely prevalent. The entire Oriental mind, for ages, had been idealistic. The Hindoos of old had mused upon the world as but a vast illusion or dream of Brahma. The Greeks had looked upon all visible

things as but unreal images, shadows, copies of original, essential archetypes, after which they had been fashioned. The fathers, Justin, Origen, Clement, who espoused the Platonic doctrine of divine ideas, had conceived of the whole intelligible creation as only a manifestation of the eternal Logos, the embodied reason or word of God. The schoolmen, who adopted the Aristotelian distinction between the form and matter of objects, had even discussed their eternal existence as problematical (especially in the Eucharist) but for the authority of the Church. The Platonic reformers, who revived classical with sacred learning, had striven to enlist such spiritual conceptions in the service of pure religion. And gradually, with the rise of philosophic thought, came more scientific phases of the same tendency.

The first was theistic, restricting our knowledge to divine ideas. Descartes, the acknowledged father of modern idealism, led the way by describing ideas as mere mental representations of material objects, excited in the mind on occasion of the senses by immediate concourse or assistance of Deity, whose veracity must guarantee their accuracy. Malebranche, as a disciple of Descartes, in his "Search for Truth," then added the celebrated theory of Vision in God, according to which material objects, as impressed upon the senses, are represented in the divine mind and beheld by our minds as in a perpetual theophany or divine phantasmagoria, attested by the Holy Scriptures and the Catholic Church. John Norris, an English rector, who had studied Plato as well as Descartes and Malebranche, followed with his "Theory of the ideal or Intelligible World," in which the vulgar belief in material objects, as distinguished from their mental representations, was based upon the mere veracity of God, their creator and constant revealer. At length Arthur Collier, a recluse thinker who held the parish next to that of Norris, repudiating the appeals to common sense and Church authority as unphilosophical, boldly pushed theistic idealism to a climax, with his "Clavis Universalis or New Inquiry after Truth, being a Demonstration of the Impossibility of an External World," or, as he elsewhere expressed it, of the dependent existence of the visible world, or of the inexistence of the

sensible world in the mind of man, and of the inexistence of the mind of man in Christ, and of Christ in God, the source of all thought and being. And these different views, as we shall see, were variously applied to the problems of Holy Scripture by such idealists as Arnauld, Nicole and Crousaz.

The next phase of the same tendency was a phenomenal idealism, which would restrict our knowledge to mere phenomena or ideal qualities. Locke, with all his realism, had retained several idealistic elements, such as his ridicule of a substance supporting qualities, like the fabled elephant upholding the world; his assertion that the secondary qualities, heat, color, sound do not exist in material objects, but only in the percipient mind; his definition of knowledge, as maintained only through the intervention of ideas and measured by their conformity with realities; and his admission that the existence of things out of the mind, though certain enough does not allow of demonstration. Richard Burthogge, a physician who corresponded with Locke, seems to have controverted or developed some of his views in an "Essay on Human Reason," in which he maintained that things are nothing to us but as they are known by us, neither their accidents nor their substances having any more being out of our minds than shadows in the water, or behind a glass do really exist where they appear. Berkeley, the spiritualistic idealist, advancing beyond Locke, then demolished, with vigorous argument, the material substances which he has simply ridiculed; claimed as purely ideal the material qualities, some of which he had already conceded to the percipient mind; exploded the very notion of matter as a mere fiction of philosophers; and thus left nothing existing but minds and their ideas, or spiritual substances and the irperceived phenomena, upheld by the divine mind or spiritual divine substance. At length, Hume, the sceptical idealist, as if to bring phenomenalism to a crisis, advancing beyond Berkeley, with subtle logic assailed the remaining spiritual substances which he had left exposed; exploded the essential notion of mind as no less fictitious than that of matter, of God as no less fictitious than that of the soul; left nothing existing but unsupported phenomena or associated ideas,

both causeless and aimless, and thus unsettled the entire fabric of human knowledge.

But the final phase has been an egoistic idealism, which would restrict our knowledge to sheer self-consciousness. Kant, the transcendental idealist, spurning common sense as the scandal of philosophy, in his "Critique of the Pure Reason," had not only distinguished between phenomena and noumena, or between things as they appear to us and things as they are in themselves, but had referred their forms and qualities to the concipient mind alone, denying external reality even to space, time and causality, as well as the ideas of God, the soul and the world. Fichte, the subjective idealist, as an advanced disciple of Kant, in his Doctrine of Science, then discarded from scientific knowledge the unknown noumena or things-in-themselves together with the ideals of practical reason; distinguished consciousness into subject and object, and developed the entire objective world of the mind out of its own subjective forms and categories as a product of spontaneous intelligence. Schelling, the objective idealist, as an advanced disciple of Fichte, with his essays on "The Ego as the Principle of Philosophy," and his "Soul of the World," proceeded to unite the objective and subjective factors of consciousness in an absolute ego or original mind, like our own, intuitively discerned as unconscious in nature, conscious in man, and self-conscious in art, the realized ideal of nature. Hegel, the absolute idealist, as a consistent disciple of Fichte and Schelling, in his Science of Logic, then maintained the absolute mind to be supremely rational, even dialectical in its evolution, and logically traced that evolution from the notion of nothingness into the categories of being, through the stadia of nature and the stages of spirit, up to the abstract thought of man, the flower and image of universal reason. At length Schopenhauer, the theoretical idealist, discarding Fichte, Schelling and Hegel, and starting afresh from Kant, as if to push the egoistic idealism to the verge of lunacy, in his treatise on "The World as Will and Notion," maintained the conscious will or developed force of the man to be the true noumenon or real cause of the whole phenomenal ego; and represented

the entire world of that ego, with its conceived earth, sun and stars, as a mere product of the brain, and doomed to perish with it when the will that uses it shall relapse to blind primordial force and nothingness as the bubble reflects the heavens only to melt back into the sea. And thus, at the idealistic extreme, our knowledge would appear little better than the dream of a dream.

According to the realists, however, our knowledge embraces pure realities. And this opinion was almost as ancient and extensive as the other. The whole Occidental mind, for centuries, had been becoming realistic. The Hebrew, in his religious realism, had worshipped Jehovah as the living God who made heaven and earth. The Roman, in his political realism, believed himself to have conquered all ideas, nay, the very gods themselves, with his invincible legions. The Latin fathers, such as Tertullian, in their crude realism, unable to conceive anything real which was not material, had attributed a refined corporeity to spirits, to the Deity himself, and even sought the divine image in the human body. The schoolmen, forbidden even to think of a mere ideal eucharist, had cowered before the mystery of transubstantiation as the real body and blood of their Lord. The reformers, in their revolutionary realism, emancipating the human mind in all directions, had hurried from the cloister to the world, to life and to action. And by degrees, with the growth of empirical research, followed more scientific forms of the same tendency.

The first was a materialistic realism, which would extend our knowledge beyond ideal to material objects. Bacon, the father of modern realism, led the way, with his love of the physical sciences, ever appealing from ideas to facts, things and particulars. Hobbes, the materialistic realist, as a disciple of Bacon, entering the mental sciences, grossly conceived of minds as mere bodies, impressing each other with ideas which were but material images, reflected like pictures in a mirror, or decaying sensations remembered like the echoes of a harp. Condillac, Helvetius and Diderot, successively following Locke away from Descartes, as realists, transformed ideas into sensations, faculties into nerves, mind into brain,

until they had merged all ideas into objects, and left nothing existing but material organisms and their material products, machine men and their manufactured sensations.

The next form was a phenomenal realism, which would include phenomena as real qualities. Andrew Baxter, the antagonist of Berkeley and the first of the Scottish realists, in his "Inquiry into the Nature of the Human Soul," maintained it to be a plain truth, not questionable, without violence to reason, that we perceive, besides our own sensations and ideas, their external objects and causes, which we call matter, as we know a picture to be a material reality and not a mere mental image or reflected likeness. Reid, the so-called natural realist, having become entangled in Hume's scepticism, determined to cut the knot which he could not loose, with a Scotch cleaver, entitled "An Inquiry into the Human Mind on the Principles of Common Sense," in which he appealed from philosophers to plain men, discarded the intervening ideas of the former and accepted the direct perceptions of the latter, as ever suggesting the real existence of external objects, with their qualities, both primary and secondary, and as affording the only trustworthy foundations of human knowledge. Stewart, also styled a natural realist by Hamilton, in his elegant "Philosophical Essays," recast and embellished the crude realism of Reid by enunciating the axioms of common sense as fundamental laws of human belief, and distinguishing among the primary qualities of matter what he termed its mathematical affections, involving real externality, space and time. Hamilton, who might be styled a critical realist so far as he was a disciple of Reid, vindicated the philosophy of common sense with exhaustive erudition and acuteness as a catholic realism of the schools no less than the vulgar belief of mankind; discriminated and defended it at all points from the bewildering phases of idealism, and expanded it so as to include among the objective realities, immediately perceived, certain primary and secondo-primary material qualities, such as gravitation, cohesion, mobility, situation, figure, extension, together with their implied substratum. Dr. McCosh, the intuitive realist, advancing beyond Reid and Hamilton, in his "Intuitions of the

Mind," besides analyzing and testing anew the primitive cognitions, beliefs and judgments, may be said to have carried phenomenal realism to its limit by maintaining that we cannot know qualities without knowing substances; that we intuitively know both spiritual and material substances as having being, power and permanence, together with their other respective qualities; and, in fact, that the very distinction between qualities and substances, phenomena and noumena, things as they appear and things in themselves, is purely fictitious and misleading. And these opinions were also variously held and applied by Buffier, Collard, Prevost.

The final form has been a substantial realism which would include substances or noumena as realities. Kant with all his idealism, had retained several realistic elements, such as his final resort to common sense, under the name of practical reason, for the objective reality of God, the soul and the world; his assumption that noumena, or things-in-themselves, have the function of affecting our senses, and his admission that the material of our knowledge comes from without into the mind, to be worked up through its forms and categories. Herbart, the father of German realism, who might be styled an essential realist, wholly discarding the idealistic side, of Kant, as a critic of Fichte and Schelling, in his "Introduction to Philosophy," maintained that our knowledge is derived from experience; that the forms and categories are given us by things, and not imposed by us upon them; that realities are therefore as manifold as our perceptions; that they cluster as simple essences, each with its own quality, around the soul, which, as a punctual essence, by its peculiar quality, ever asserts and preserves itself among them according to the relative intensity of their impressions; that ideas thus emerge in consciousness, in a more or less contradictory state, and that it is the task of philosophy to elaborate logically and mathematically the conceptions which are thus formed of surrounding realities. Beneke, who might be styled a dynamic realist, departing from Kant with Schopenhauer beyond Herbart, in his "Theory of Knowledge," and his "Groundwork of Metaphysics," held that true knowledge, both as to matter and form, originates wholly in experience;

that it embraces nouemena or things-in-themselves; that through self-consciousness or internal perception we can thus directly know the noumenon or real nature of the soul; that we know it to be not a mere punctual essence, nor yet a mere blind will, but an intelligent activity or system of psychical activities; that we may also know other noumena or external realities under the phenomenal world around us so far, but only so far, as they are psychically analogous to ourselves; and that, consequently, our real knowledge must decrease as we descend from human souls, through the scale of animal instincts and vital powers to the mere unintelligent forces of inorganic nature. Hermann Lotze, who might be styled a spiritualistic realist, uniting Herbart and Beneke upon the basis of Leibnitz, has suggested, among other brilliant conjectures in his "Metaphysic and Microcosmos," that knowledge is itself a real process, as may be seen in the development of perceived colors out of ethereal vibrations; that all phenomena thus spring from the interaction and passion of percipient noumena, living atoms or monads; that even the lowest monads, the material elements, have feeling, and that the scale of animated nature embraces infinite myriads of conscious beings in a teleological series, terminating and subsisting in God, the only absolute Person. Coleridge seems prophetically to have sung of such a Being, as—

> "That one, all conscious Spirit, which informs
> With absolute ubiquity of thought
> All His involved monads, that yet seem
> With various province and apt agency
> Each to pursue his own self-centering end;
> Some nurse the infant diamond in the mine;
> Some roll the genial juices through the oak;
> Some drive the mutinous clouds to clash in air,
> And, rushing on the storm with whirlwind speed,
> Yoke the red lightning to their volleying car."

Dr. Gustav Fechner, the distinguished physicist and critic of Hegel and Herbart, though an idealist of the idealists, on one side of his system would seem to have become on the other side, a realist of the realists, beyond Herbart, Beneke or Lotze, by arguing in his "Atomology and Psycho-physics,

that phenomena are only produced and upheld by souls in their mutual self-manifestation; that souls thus manifest themselves through phenomenal bodies, composed of spaceless atoms; and that such souls subsist throughout organic nature, not only in plants, animals and men, but with magnified proportions in the celestial bodies, and even the universe itself, which is but the manifest soul of God. And thus, at the realistic extreme, our knowledge would claim to include nothing less than the very essence of things.

Absurd and irreconcilable as realism and idealism may seem at their extremes, they are not yet exhausted, but have been variously combined in different countries and under different systems. In Italy, Roman Catholic thinkers have assumed them in maintaining a Christian philosophy; Rosmini having developed everything from pure ideality as the primal reality and source both of the actual and moral; Gioberti having taken the opposite starting-point of absolute reality as directly known in consciousness; and Mamiani having blended both tendencies in a form of idealistic realism. In Germany, Trendelenberg has advocated an idealistic realism, based on the natural sciences as involving a concurrence of thought and being; Chalybäus in his "Doctrine of Science" has sought to complement the Hegelian idealism with the Herbartian realism; the younger Fichte has held the Kantian forms of time and space to be accompanying qualities of real things as well as their ideal forms; and Ulrici has maintained that the most thorough idealism and realism will require each other in a complete philosophy. In England, so long the home of realism, the secret of Hegel has been disclosed by Stirling and his absolute idealism defended by Thomas Hill Green at Oxford; while at Edinburgh, Frazer has recalled the idealism of Berkeley and Seth and Caird are seeking to unite German idealism with Scottish realism as to the spheres of knowledge and faith. In America, Krauth has set forth the strength and weakness of idealism; McCosh has re-affirmed his realistic philosophy in distinction from agnosticism as well as idealism; and Francis Ellingwood Abbot has based his scientific realism upon pure noumenism and objective relationism. With so many great

names and wise opinions in favor of both tendencies it would seem but reasonable to infer that they severally contain valuable elements of truth which may yet somehow be eliminated and combined.

Empiricism and Transcendentalism.

As to the second problem of philosophic science, the method or process of knowledge, there arose also two rival schools, the transcendentalists and the empiricists. According to the former, all science proceeds deductively, from principles to facts, from reason to experience; and the tendency was of ancient and extensive growth. The whole Eastern mind, for ages, had been intensely transcendental. The Hindoo had plunged into the Ganges, and under the car of Juggernaut, in search of that nirwana, or original abstract being out of which all finite existence had at first emerged only as a guilty abortion. The Greek, as he wandered amid his faultless temples, had mused upon those more divine archetypes which were so imperfectly copied in things. The fathers, in cloister and council, had speculated upon the transcendental mysteries of a pre-existent Logos and Trinity before the world was. The schoolmen, with their brilliant logomochies had fought, like Milton's embattled angels, over ante-mundane problems and pre-existent universals. Even the reformers, for all their experimental religion, had ever reverted to the most transcendental predestinarianism concerning the divine decrees. And with the rise of speculation came more scientific phases of the same spirit.

The first phase of transcendentalism was theological, deducing everything from the Divine attributes. Descartes, reasoning from the conception to the existence of God as the most perfect being, all-mighty, all-wise, and all-good, and assuming an original plenum of vortices, including material and spiritual substances, proceeded from these premises to demonstrate how the existing world might have been created. Spinoza, reasoning from the Cartesian definition of substance as independent existence to the being of God, as the only one substance with the two attributes of thought and extension, mind and matter, thence proceeded with an array of axioms

and propositions, after the manner of Euclid, to demonstrate how the existing world must have been created. Leibnitz, converting the infinite and finite substances of Spinoza and Descartes into analogous graduated beings or monads, conscious and unconscious, material and spiritual, and assuming their pre-established harmony, then essayed, with his axiom of a sufficient reason for everything good or evil, to demonstrate the existing world as the very best that could have been created. And by similar reasoning a succession of theodicies, or divine systems of the universe, were unfolded with endless variations from the days of Wolff until the time of Kant.

The next was a psychological transcendentalism deducing everything from self-consciousness. Kant, as we have seen, had left many problems in his transcendental logic, which his successors were eager to solve. Fichte began the task with his subjective egoism; and, assuming both the content and form of knowledge, to be produced by or created through the mind itself, he exhibited, in opposition to vulgar impressions, the whole existing world as a mere projection of the ego or reflection of the philosophic consciousness. Schelling soon followed Fichte with his objective egoism; and postulating one original intelligence as objective in nature and subjective in man, he essayed in advance of inductive research, according to the laws of our own consciousness, to reconstruct the whole existing world as a product of the infinite consciousness. Hegel then advanced between Fichte and Schelling with his universal dialectic; and maintaining that the absolute mind must have proceeded rationally, even dialectically, in producing all things out of nothing, he essayed by mere formal logic, according to the laws of thought, to re-think the whole existing world as a process of pure reason. And from each of these schools a swarm of such speculative cosmogonies, or logical systems of the universe, has been issuing until the present hour.

But the latest phase of transcendentalism has been ontological, deducing everything from the Absolute itself. Fichte, Schelling and Hegel, through all their rigorous logic, retained an unknown quantity, a sort of potential source of all actual being, termed by the first the absolute self, by the

second the absolute mind, and by the third the absolute idea or thought; and this unknown quantity had yet to be eliminated or resolved. Hegel, indeed, of the three had assumed the least, by apparently starting from the notion of nothing, excluding the personal element from the absolute reason, at least in its objective expression, and retaining only a sort of unconscious logic or ceaseless thinking according to the laws of thought. Schopenhauer, then seizing the problem anew, declared the will to be the only known cause and support of that phenomenal ego, out of which his predecessors had evolved all knowledge, and tracing the will downward through nature to mere original blind force, he pronounced the whole existing intelligible world, when thus unmasked, to be a sheer illusion, like a dream in the night. Hartmann, endeavoring to reconcile the panlogism of Hegel with the panthelematism of Schopenhauer (or so-called doctrine of universal will), has postulated thought with will, reason with force, as co-ordinate factors of all phenomena throughout irrational nature, and accordingly projected the whole existing world, in its present historical stage, as but a transitional fiction, like a dream before the dawn. Julius Bahnsen, however, insisting against Hartmann that the systems of Hegel and Schopenhauer, together form a sort of universal paralogism, has recently argued in his "Philosophy of History," that nature originated in contradictions, and proceeds, through logical and actual conflicts, into sheer aimlessness; and has consistently not hesitated to proclaim the whole existing world, as it issues in consciousness, one abortive paradox and very nightmare of reason. And thus, at the transcendental extreme, all knowledge would seem logically reduced to absurdity.

According to the empiricists, however, all sciences proceed *a posteriori*, from facts to principles. And this tendency, though of later origin than the other, had been rapidly increasing. The whole Western mind had been becoming thoroughly empirical. The Hebrew, since the days of Enoch, had turned from the worship of idols to actual converse with Jehovah through all His works and word and ways. The Roman, yoking philosophy to the chariot of

Cæsar, had celebrated an empire of facts over that of ideas. The Latin fathers, led by Augustine, had exchanged a speculative, pre-mundane theology for polemical definitions of the Church, of inherited sin, of human conduct. Even some of the schoolmen, such as Albert, Raymond Lully and Roger Bacon, had digressed from speculative divinity into the natural sciences and had striven for their emancipation. The practical reformers of philosophy, such as Copernicus, Galileo and Kepler, had already proceeded, in their physical investigations and discoveries, upon empirical methods which had yet to be defined. And at the same time, with advancing science, came the more philosophical forms of the tendency.

The first was phænomenological, referring everything to mere phenomena. Leonardo, Telesius and Campanella, as pioneers of empiricism, successively announced, that theory is the General, and experiments are the soldiers; that the construction of the world is not to be investigated by reasoning, but apprehended by the senses and collected from things themselves; and that the accumulated systems of philosophers must now be compared with the world itself as mere copies with the original epistle of God. Francis Bacon, the greatest of modern empiricists, deprecated at the outset of his Instauration, that we should ever offer the dreams of fancy for a model of the world; prescribed in his "New Logic," the rules for observing, arranging and generalizing facts; and ever made it his capital precept, that the mind be not taken off from things, but limited thereby, lest working upon itself, like the spider, it produce mere cobwebs of learning, admirable for their fineness, but of no use and profit. Gassendi, in a Treatise of Logic, anticipated the French reactionary empiricism by defending Bacon against Descartes, as a philosopher who sought aid from things to perfect the cognition of the intellect, instead of leaving it to its own ideas and powers. And through such methods, more or less consciously pursued, the physical sciences began rapidly to be unfolded by hosts of investigators from Bacon to Newton.

The next form of empiricism was ætiological, referring everything to causes. Bacon, bequeathing to posterity the magnificent project which he could not finish, had left the

efficient causes of things still enwrapt in mediæval obscurity, and relegated their final causes or special ends to natural theology as barren of scientific results, like vestal virgins consecrated to God. Newton was the first to distinguish clearly the causes of phenomena from their forms or laws; and in his "Principia," declared it to be the business of philosophy to deduce causes from effects till we come to the First Cause, which is certainly not mechanical. Robert Boyle as an antagonist of Descartes, maintained, in his "Inquiry into the Final Causes of Natural Things," that it is not presumptuous or idle to inquire after such causes if it be done cautiously with due regard to their efficients; that even inanimate bodies may act for ends as designed by the First Cause; and that ends in nature may be studied in four classes; the universal, or such as display the power, wisdom and goodness of the Creator; the cosmical, or such as maintain the order and beauty of the world; the animal, or such as mould and preserve the body; and the human, or such as consciously exist in man alone. Reimarus, in his "Logic," and "Instincts of Animals," defending the Leibnitzian principle of sufficient reason against Maupertuis, maintained that final causes have as solid a foundation in nature as in reason, that they conduct to important discoveries in the physical sciences, and that philosophy requires them in order to construct the scale of natural history upon the basis of natural theology. Cuvier, as he himself declared, by the principle of final cause or design, was enabled to enrich natural history with all the splendid results which have made him so illustrious, not only erecting the whole living world in teleological series, each individual, species and class with its own end and relation, but even recalling the extinct creations of former ages in one vast plan of nature. Whewell, in his "Philosophy of the Inductive Sciences," vindicated the proper place of causes in physical researches; distinguished laws as but the means between efficient and final causes; defined the mechanical, chemical and vital causes of corresponding phenomena; and sketched the palætiological sciences, as he termed them, which connect a great First or Final Cause with the origin and development of the whole existing world, of the heavens,

of the earth, and of man, with all his peculiar interests. And by such processes, though seldom admitted and sometimes disavowed, immense cosmologies, geologies, and systems of natural history have been succeeding one another until the present moment.

But the final form of empiricism, has been nomological, referring everything to mere laws. Newton, Cuvier and Whewell, through all their experimental researches, ever retained certain transcendental elements, the axioms or intuitions of power, cause and purpose, which other physicists were anxious to extirpate from the body of knowledge. Maupertuis had already, in his "Essay on Cosmology" banished final causes from the moral and speculative sciences as mere mental entities, and bagatelles, presumptuously attributing to God our frivolous human intentions. D'Alembert had secluded them from the mathematical and physical sciences, with the ingenious metaphor of Bacon, as the vestals in the temple of knowledge. Buffon, though he plainly employed them in his Natural History, had discarded them as useless and even noxious fictions in scientific researches. Geoffrey St. Hilaire, in opposition to Cuvier, had declared that he knew nothing of animals which play a part in nature. Aguste Comte, as if to formulate these views, in his Positive Philosophy restricted exact knowledge to the laws of phenomena, and stigmatized all causes, the first, the efficient and the final, as mere theology and metaphysics, the rude guesses of an infantile curiosity, which science, by the very law of its growth, is leaving behind it among ancient myths and mediæval notions. John Stuart Mill, in his "System of Logic," not only adopted the positive principle of Comte, but completed the empiricism of Hume, Stewart and Brown, by resolving all efficient causation into mere experienced sequence, and even maintained, in opposition to Whewell, that axioms themselves are but generalized experiences, so that two and two may not be found to equal four among the inhabitants of the Dog-Star. Herbert Spencer, as if he would root out the last shred of transcendentalism from his "First Principles of Philosophy," after undermining and exploding, by the Hamiltonian logic, the very conception

of an absolute First Cause of the existing universe, has left the superstructure reposing upon an ultimate truth or final generalization, which he terms the persistence of force rather than the conservation of force, because the latter phrase would imply a Conserver and an act of conserving; in other words, has made it the great fundamental axiom, that the world continues because it continues. And thus, at the empirical extreme, our most certain knowledge would seem based in sheer uncertainty and absurdity.

Notwithstanding the extremes to which Empiricism and Transcendentalism have been driven, they are still eagerly pursued, sometimes apart, sometimes together, by scientists as well as philosophers of different countries. In Germany, while Haeckel has inculcated mere empiricism, Witte has advocated pure transcendentalism as the method of science; Tobias has made both philosophy and science limit each other with problems which neither can solve alone; Dietrich finds their latest alliance in the new evolutionistic teleology; and Ludwig Noiré predicts that the transcendentalism of Schopenhauer and the empiricism of Darwin are yet to be combined in the one monistic philosophy of the future. In France, the scientific empiricism of Bourdeau is balanced by the transcendental psychology and teleology of Renouvier and Paul Janet. In America, the early literary transcendentalism of Emerson, Ripley and Alcott has given place to the more speculative transcendentalism of Bowen, Bowne and Harris, as well as to the eclectic empiricism of Fiske and Abbott. In England, though the extremes seem to have been reached in the physical metempiric of Barrat and the physical realism of Case, yet both tendencies may be found combined by Jevons in his transcendental principles of science, by Bradley in his idealistic principles of logic, and by Bosanquet in his idealistic morphology of knowledge. Of Herbert Spencer's philosophy Dr. Fairbairn has conclusively remarked, that it is at once an empirical idealism, a transfigured realism, and an agnostic transcendentalism. Such a strange commingling of the two tendencies and parties throughout the philosophic world would seem to justify the

poetical forethought of Schiller nearly a hundred years ago, that Transcendental Philosophy and Natural Science, taking opposite routes from Kant, would yet meet again, each the better for a long estrangement.

Positivism and Absolutism.

As to the third remaining problem of philosophic science, the destiny or goal of knowledge, there have arisen the two rival schools of absolutists and positivists. According to the former, science ever tends to absolute knowledge. And it is a yearning which, in different forms, with more or less distinctness, has been gathering strength for ages. The entire philosophy of the Orient claimed a sort of universal intuition. The Brahmin, in his pride of caste, believed himself on the verge of nirwana, about to fathom the secret of the world. The Eleatics, Zenophanes, Parmenides and Zeno, at the dawn of Greek thought, seized that one only being out of which successive schools unfolded the endless multiplicity of phenomena, until the sophists swarmed forth with a pretended universal knowledge. The Gnostics of the early Church and the Alexandrian fathers, behind the popular faith, wove together all human and divine wisdom as affording nothing less than a consummate philosophy. The dogmatists of the middle ages, within the pale of an infallible Church, proudly walked the closed circle of the sciences and claimed their "sum of theology" as the sum of knowledge. The mystics of a later day, Eckhart, Tauler and Rusbroek, dreamed of a profound absorption in the absolute godhead, by which they became conscious of all things. The theosophists of the Reformation, Paracelsus, Helmont and Boehme, claimed to have read all the secrets of nature and Scripture under an immediate illumination. The reforming philosophers of the next period, Descartes, Spinoza and Leibnitz, who began by doubting, ended by explaining everything with geometrical logic, from the interior essence of God to the problem of creation, including the development of the actual, necessary and perfect world from among all possible worlds, and thus bequeathed to Wolfe the materials which he wrought into a

universal system, both rational and empirical. And in our own times have followed still more philosophical claims to such absolute science.

The first claim has been that the Absolute or Infinite is at least conceivable. Kant, the unwitting father of modern absolutism, and the first to define it since the days of Parmenides, though he struck the whole Wolfian metaphysic from the list of sciences, still retained its germinal principle, the notion of the absolute or infinite, as an idea of the pure reason, generalized from the finite and contingent. Professor Calderwood, defending this notion of Kant from the attacks of Hamilton, has ably maintained, in his "Philosophy of the Infinite," that the infinite may exist in relation to the finite, and still be absolute or independent; that man does realize a conception of the infinite Being, positive in its content though partial, indefinite and insusceptible of completion; and that this conception is an ultimate fact of consciousness, and not the result of any logical demonstration. The similar views now reproduced in this work were published at the same time. Professor Ferrier, advancing beyond Kant and Calderwood, has argued with wonderful subtlety and clearness, in his "Institutes of Metaphysics," that there can be no being without knowing, no object without a subject, no existence out of relation to intelligence; that although strictly speaking, we are ignorant of other absolute existences than ourselves, yet they are at least conceivable, as analogous beings or minds in synthesis with things; that the only necessary absolute existence, called God, is conceivable as an infinite mind in synthesis with the universe, and that this conception not only may, but must be formed by every thinking mind, a world without a God being a clear absurdity. And it will be admitted as a matter of fact, that since the time of Kant the conception itself, whether negative or positive, partial or perfect, absurd or logical, has been almost unquestioningly accepted by hosts of profound philosophers as the germ of numerous systems of absolute knowledge.

The next claim advanced, therefore, has been that the absolute or infinite is cognizable as well as conceivable. Fichte, having been charged with atheism for his view of

God as a mere regulative idea of the mind, wrote a "New Exposition of the Science of Knowledge," in which he conceived the absolute as the Infinite Ego, embracing all finite egos, yet expressed in them, and therefore knowable, by the analogy between the human and divine consciousness. Schelling, however, having conceived the absolute as a transcendental ego beyond our consciousness, beyond both man and nature, the one original soul of the world, could only cognize it by becoming one with it, by lapsing from consciousness into it, by losing and finding himself in it, through a mystical act, which he termed the intellectual intuition, and claimed as the sole prerogative of philosophic genius. Krause, a pupil of Schelling, who endeavored to convert his pantheism into panentheism, or the doctrine of the immanence of the world in God, held still more emphatically that the intuitive cognition of the infinite, or, as he termed it, the vision of the one all-exclusive primal being, must be made the beginning and end of philosophy, as the science of the absolute. And whatever may be thought of such peculiar cognition, whether it be fictitious or genuine, obscure or clear, it has certainly been assumed as the basis of the most stupendous speculations of modern times.

The final claim has been that the absolute or the intelligible universe is comprehensible as well as conceivable and cognizable. Hegel, having defined the absolute as pure reason or essential thought, maintained against Schelling that it is not to be reached by any one swift intuition, as if shot out of a pistol, but discursively, through the dialectical process; and accordingly, by sheer logic, by unfolding one notion out of another, from the poorest up to the richest, he boldly claimed to reconstruct all things from nothing, to re-think the whole thought of the Creator, to comprehend the beginning, cause and end of creation; in a word, to logically solve the problem of the universe. Cousin, the enthusiastic interpreter of Hegel, in his "History of Philosophy," still more distinctly pronounced this creative logic, this development of the universe according to the laws of thought, this reasoning out the world problem by the world-mind, to be necessary rather than voluntary in the Creator, and therefore when

reflected in human consciousness, as intelligible and comprehensible as any other logical process. Schopenhauer, however, insisting against Hegel, what Cousin admitted, that such panlogism, involves theism, declared that he alone of all philosophers, had eliminated the remaining unknown element and rendered the universe perfectly comprehensible, as a "macranthropos" or phenomenal manifestation of human will and thought. Hartmann more recently, as the conciliator of Hegel and Schopenhauer, has argued that the triumph of thought over force, reason over will, in the development of the world, or the full comprehension of the absolute, must be gradual rather than immediate, and is not to be attained logically, in the individual, but historically, in the race, through the empirical progress of knowledge. And thus, according to the extreme absolutist, our science must sooner or later end in omniscience.

According to the positivists, however, all science still tends to mere positive or finite knowledge. And this apprehension, in certain classes of minds, has been gaining ground for centuries. The peculiar philosophy of the West has ever confessed a sort of conscious ignorance. The Hebrew, in the time of Job, quailed before the same enigmas which the Egyptian, in despairing agony, had expressed in the sphinx, the obelisk and the tomb. The Greek had his temple of Isis, inscribed to that absolute Being, whose veil has never been withdrawn by mortals; and recoiling at length with Socrates, from the shallow pretence of the sophists, despaired of all knowledge as but the learning of our ignorance, and of religion itself as a mere altar to the Unknown God. The Roman, amid these decaying philosophies, with their unsolved riddles, when confronted with Truth itself, could only sneer, What is truth? The Latin fathers, Tertullian, Lactantius, Augustine, claimed it to be a function of revelation to expose all heathen philosophy as false science, and substitute a divine wisdom, adapted to our limited faculties and interests. The more sober schoolmen, Anselm, Albert, Aquinas, amid all these daring speculations upon abstract godhead, had glimpses of its essential incomprehensibility and of the narrow scope of their dogmatic

knowledge. The critical schoolmen, Duns Scotus, Occam and Raimond, by analyzing all and discarding some of the traditional demonstrations of the Divine Being, anticipated Kant in shaking the very foundations of every metaphysical theory of the universe. The religious reformers, Luther, Melancthon, Calvin, against the claims of an infallible Church, urged a definite revelation of secret things which belong unto God, as unrevealed and unrevealable mysteries. The philosophical sceptics, Montaigne, Charron and La Motte, despaired of any complete knowledge, either from reason or revelation. And in later times came still more philosophical admissions of a mere finite science.

It was first granted that the infinite is incomprehensible. Bacon, in his "Advancement of Learning," erected physics and metaphysics as ascending stages of a pyramid, whose vertex is lost in divinity, beyond the reach of those daring spirits who would build the sciences, as the giants piled Pelion upon Ossa, with the vain hope of invading heaven. Hobbes excluded from his "Elements of Philosophy" the whole region of theology as incomprehensible, together with all knowledge derived from revelation, and limited science to mere bodies, physical and political. Locke, with still more emphasis, disclaimed any affectation of universal knowledge, and at the very outset of his Essay turned away from that vast ocean of being which had been so idly claimed as the natural and unbounded possession of our understanding, wherein was nothing exempt from its decisions or that escaped its comprehension. And this restriction of science to the finite, whether unintentional or avowed, theistic or atheistic, became practically the principle upon which the great body of English philosophers proceeded.

The next similar admission, however, was that the infinite is not merely incomprehensible but incognizable. Even Descartes, Malebranche and Maupertuis, though devout theists, by pronouncing the search for final causes misleading, idle and presumptuous, simply secluded their theology as a recondite province of revelation, wholly unknown to science, or retained it in the form of metaphysics. D'Alembert, Robinet and D'Holbach, however, by ignoring or rejecting that First

Cause, of which all second causes are but expressions, by referring the universe to an unknown God, or incognizable principle, at length excluded both metaphysics and theology from the physical sciences as wholly useless and superstitious, and consistently constructed their Encyclopædia upon a finite basis as a mere system of Nature. Auguste Comte, the latest reformer of the same school, merely enunciated its chief doctrine, in the form of an historic law or generalization, by maintaining that as the sciences successively become perfect, they outgrow all theology and metaphysics, as mere infantile conjecture and exploded hypothesis. George H. Lewes, the chief English interpreter of Comte, in his "History of Philosophy," has but attempted to trace, through ancient and modern times, the supposed emancipation of science from theology and metaphysics, and its gradual transformation into a positive philosophy, which shall forever ignore the absolute as unknowable. And this contraction of science within the finite, whether desired or deprecated, from the most opposite motives, has at length been accepted as a logical as well as historical principle of scientific development.

As if to bring the positivist tendency to a climax, the final admission has been, that the infinite is not only incognizable but utterly inconceivable. Hamilton, in his "Philosophy of the Conditioned," defining the infinite as the unfinished and the absolute as the finished, and claiming both as phases of the unconditioned, has then labored to prove that our conception of them is a mere bundle of negations and contradictions; that consequently a science of the conditioned alone is possible; and that the German philosophies of the absolute, since the time of Kant, have been a series of mere impotent speculations. Mansel, in his "Limits of Religious Thought," as a disciple of Hamilton, has argued that we are constitutionally compelled to believe in an absolute Being, whom we can neither know nor conceive; that the revelation of such a Being, can only be an accommodation of infinite truth to our finite faculties, and that all rational theology, proceeding from the conception of an absolute First Cause, must ever destroy itself with endless self-contradictions. Herbert Spencer, in

his "First Principles of Philosophy," has at length turned the destructive criticism of Hamilton and Mansel against both metaphysics and theology, declaring it to be at once the height of impiety and absurdity to represent the absolute reality manifested in the universe, the great First Cause, as other than essentially unknowable and even utterly inconceivable. And thus, according to the extreme positivist our science at last must end in sheer nescience.

Both Positivism and Absolutism still have advocates, extreme as well as moderate. In Germany, instead of the absolute world-will of Schopenhauer, Prof. Frohschammer has depicted a world-fancy unfolding the universe with lavish beauty and order; Prof. Gonne has discerned the Absolute revealed as a mysterious force in nature, and presented in consciousness as God; Frau Plumacher, partly agreeing with Hartmann, makes the absolute being unconscious, yet sensitive; and Dr. Carl Peters traces the Will of the World, no less than the world of the will, to a volitional ego as distinguished from the unconscious volition of Schopenhauer. In England the French positivism of Comte has been rigorously maintained by Mr. Frederick Harrison against the covert absolutism of Spencer; Mr. Malcolm Guthrie has argued that Spencer's unification of the knowable cannot be based upon his unknowable absolute; Captain McTaggart has advocated an absolute relativism or unknowable infinite activity manifested as stimulus and response; Dr. T. H. Webb, of Dublin, has traced the history of modern idealism to prove that the veil of Isis must forever hide the mystery of absolute being; while Mr. Shadworth Hodgson still claims a wide space for metaphysic between the English positivism and the German absolutism, and Prof. Andrew Seth, in the spirit of Scottish realism, holds that metaphysic may embrace absolute existence as still largely unknown, yet not wholly unknowable. In a former chapter on the Theory of Perfectible Science it was maintained that positive knowledge is indefinitely extensible toward absolute knowledge, and the two ideally coincident in the Ultimate Philosophy.

The rational province of philosophical science is thus found to contain two rival schools of speculation concerning

the origin, development and goal of scientific knowledge. Realism, empiricism, and positivism are antagonized by idealism, transcendentalism and absolutism. Neither school, however, can claim to have gained predominance, for the simple reason that each may hold its ground within the limits which it imposes upon the other, while both may yet be found correlative and complementary. Let us look at them separately and then as combined.

On a first view and up to a certain point, the sciences in their history may seem to have been becoming wholly realistic and empirical. Emerging from mere phænomenology or crude knowledge of facts, they have been first teleological, seeking divine purposes in phenomena, then etiological, seeking also their second causes, and at length nomological, seeking only their laws. Especially do the physical sciences appear to have thus become positive, by ceasing to be supernaturalistic and metaphysical. Astronomy has long since emerged from astrolatry and from astrology as the exact science of celestial mechanics, having nothing to do with Olympian gods and heavenly angels or with rhythmic numbers and prime movers. Geology, as freed from Scripture cosmogony and natural theology, is more concerned with terrestial chemistry than with ancient miracles and catastrophes or with the religious lessons and moral uses of nature. Anthropology is already shocking biblical dogmas and speculative conceits in its effort to reach the summit of biological or organic science with a new theory of races, languages and arts. And it is also anticipated that the psychical sciences must pursue the same course, until at length psychology shall have merged morality in automatism, sociology shall have substituted political prevision for divine Providence, and even a new theology shall have supplanted the traditional divinity with a scientific religion of humanity. So long as we thus stay within the empirical field of inquiry all the sciences will seem destined to be purely realistic and empirical.

But on a wider view and from this point forward in their history, they will appear to be becoming also largely idealistic and transcendental. Their procedure is soon seen to be reversed. Having reached the nomological stage as a

knowledge of mere laws, they next become etiological, seeking for causes of those laws, and at length teleological, seeking for the ends or final causes of those causes. At least the psychical sciences are still mainly metaphysical rather than positive or empirical. Theology, if it admit the conception of laws in divine Providence, retains them as the mere expressions of a sovereign Will which is their only source and animus and whose purposes they but execute. Sociology, though beginning to discern the laws of collective action, reserves within them the sphere of free-will and has its theories of divine order as well as of human progress. Psychology, for all its new laws of association and reasoning, insists upon responsibility and speculates as of old about virtue and immortality. Even the physical sciences have become teleological as well as nomological. Anthropology, while seeking the organic laws of the human body, does not disdain speculative inquiries into the successive ends and means by which nature has advanced, step after step, from the mollusk up to the mammal and from the mammal up to man. Geology, amid all its organic and chemical laws of terrestial growth and structure, has merely replaced the Biblical hexæmeron with a more complex teleology, in its search for origins and types, gaps and missing links in the ancient processes and extinct dynasties of nature. Even astronomy, despite its most rigorous mechanics, has ætiological speculations about the birth and growth of worlds which would only exchange the lucid genesis of Moses for the nebulous cosmogony of LaPlace. As we have shown in the preceding chapter, all the sciences throughout their transcendental region appear to be increasingly idealistic.

On a full view of their whole field and history, therefore, we shall now see that in varying forms and degrees, they are at once realistic and idealistic, empirical and transcendental. In becoming exact they are first teleological, then etiological, at length nomological, and thereafter in becoming complete they are first nomological, then etiological and at length teleological. In other words, during the former process the search for purposes in phenomena gives place to the search for causes and the search for causes to the search for laws,

and thenceforward during the latter process the search for laws is followed by inquiry into their causes and inquiry into their causes by inquiry into their ends and purposes. Already the sciences involve and require both processes. The physical sciences involve the empirical process, having passed from supernatural agents and occult powers to purely phenomenal laws; but they still require the transcendental process, not having fully traced such laws through their organical, chemical, mechanical forces or causes back to one primary and ultimate cause. The psychical sciences involve the transcendental process being familiar with the causes of mental, social and religious phenomena, but not having clearly traced their laws which are but the modes and means of their causes. Only by combining and maturing both processes can all the sciences become really as well as ideally complete.

It becomes now a legitimate inference, though in advance of later reasonings, that the positivist and absolutist tendencies of science are also reciprocal and complementary. In a word, our nomology and teleology can only be perfected in ontology or theology. As the laws of phenomena are but modes of causes and means to ends, it follows that the whole series of causes must have some one first and final cause of all phenomena. At least, we can readily form the idea of such a *Causa causarum et Ratio rationum* of the universe. Deriving our notion of causality from our own consciousness of will and reason, we are led to conceive of one Original Will as the potential source of all forces and causes acting throughout immensity and of one Absolute Reason as the ultimate sum of all means and ends unfolding to all eternity. We may postulate that Rational Will as a real personality or as an ideal personification. In either case the idea of such a First and Final Cause of all phenomena is necessary in order to give unity and consistency to our knowledge of the intermediate causes and laws. Without that idea, the nomologist, though he knew all laws, would still need to know their rational source; and the teleologist though he knew all causes would still need to know their supreme reason. Without that idea, the positivist would be left in a universe

wholly causeless; and the absolutist, in a universe utterly aimless. By means of that idea, both may find a universe intelligible, as no longer a chaos but a cosmos pervaded with law and purpose. In view of that idea, an omnipotent Will may be seen proceeding with infinite Wisdom toward an absolute Reason throughout immensity and eternity, in all mechanical, chemical, vital, spiritual, social, religious forces, laws and purposes, with ever growing power, life, intelligence and glory. And through that idea at length, both positivism and absolutism may unite upon a pure theism as not less true in science than in religion.

At present we merely touch upon this profound problem because of its close connection with other questions. The two philosophic tendencies, as pursued apart, would not only run into wild extremes, but might also become irreconcilable with certain revealed doctrines which must next claim attention as an existing portion of philosophic science.

Doctrine of Revealed Knowledge.

In the revealed section may be traced a like gradual severance of revelation from reason, as the source of human knowledge. In the first stage came the healthy reaction against a false Protestantism, the rationalism which was turning free thought into license. It was the time when the champions of Christian Evidence were entering the lists of philosophy to meet their opponents on the open field of right reason and free discussion. Cudworth, Bentley and Warburton, had opened the warfare as in the cumbrous mail of an old tournament, with their rash feats of logic and learning, against the scepticism of Hobbes, the free-thinking of Collins and the paganism of Morgan. Bishop Berkeley, the prince of Christian idealists, returning from a rocky alcove of Rhode Island, where he had composed those elegant dialogues in his "Alciphron or Minute Philosopher," which was to confound the small wits of his time, proceeded to lay a foundation for the metaphysical evidences of revelation in the very principles of human knowledge. Bishop Butler, the greatest of Christian realists, whose architectonic genius wrought into one high argument the closely-packed results of twenty years'

hard thinking upon the religious problems of his age, now projected the scientific evidences through the whole analogy of religion and nature. Dr. Nathaniel Lardner, the chief of Christian antiquarians, pressing the foe beyond Butler and Berkeley from the citadel to the outworks, then built, with life-long toil, patience and judgment, those impregnable bulwarks of the historical evidences, his "Credibility of the Gospel History," and his "Ancient Jewish and Heathen Testimonials." Newton, Keith and Croley gathered the prophetical evidence. The miraculous evidence was defended by Watson, Campbell, Paley, Sherlock, Lyttleton. As the field of conflict changed from one country to another, hosts of great apologists, such as Neander, Ebrard, Ullmann and Luthardt, Norton, Greenleaf, Rawlinson, Alexander, Fisher, McIlvaine, Barnes and Storrs, not without help from the Roman Catholic Demonstrations and the rationalistic exegesis, have been forming evidential schools for definitely settling the whole doctrine of divine wisdom, as revealed by the Holy Spirit.

But meanwhile, in the next stage of separation, and seemingly unaffected as yet by the modern speculations concerning the origin, development and destiny of human knowledge, have remained the traditional dogmas as to the inspiration, the canon and the fulfillment of the Scripture. As to the inspiration of the Scriptures, Catholics and Protestants have been agreed in maintaining the possibility, necessity and fact of a revelation, and in defining it as a supernatural communication of knowledge from God to man, through the prophets and apostles, by the aid of the Holy Ghost. The Jansenists, more strictly than the Jesuits, have claimed a verbal as well as ideal inspiration, while the later Protestant divines, through their conflicts with rationalism, have matured the tenet of plenary inspiration, embracing both the words and the ideas of the sacred writers. Moreover, the most varied opinions prevail within the limits of orthodoxy, as to the normal relations of reason and revelation, and the degree to which they may coincide and co-operate in different fields of inquiry.

As to the canon of Scripture, a more serious disagreement

began at the Reformation. The Roman Catholic Church, by the Council of Trent, declared the only source of divine knowledge to be contained in the Latin Vulgate version of the Scriptures, the Apocrypha and the unwritten traditions of Christ and the Apostles, as interpreted by the Holy Mother Church alone, through the infallible decrees of her councils and pontiffs. The Protestant or Lutheran Church, in her Book of Concord, repudiated the traditions, ignored the Apocrypha, declared the writings of the fathers not of equal authority with the Scriptures, and appealed to the word of God, freely interpreted, without the councils, by both clergy and laity, as the only rule according to which all dogmas and doctors ought to be estimated and judged. The Church of England, in her Articles, depreciated the traditions, the Apocrypha and the decrees of Councils, but maintained her own authority in prescribing such rites and ceremonies as are not contrary to the word of God, while otherwise allowing the right of private interpretation. And the different Reformed Churches, in both the old world and the new, besides maintaining that the Holy Scriptures contain the only rule of faith and practice, have clearly distinguished between the scientific or systematic exposition of the contents of the original Hebrew and Greek, and that saving knowledge to be derived even from the common version, as read by the aid of the Holy Spirit.

As to the fulfillment of the Scripture, while all Christians are agreed that the canon is complete, yet the Catholics, by their doctrine that the Church is an infallible teacher, provide for continuous accretions of religious knowledge, and Protestants, with their claim to divine illumination, admit that large portions of Scripture, especially the prophetical books, remain to be fully comprehended, and that their full comprehension is to be attained in the progress of sacred learning, or, as the Millennarians hold, by new dispensations and revelations, bringing miraculous accessions of truth and wisdom. The attempt to complete them by means of the sciences will more properly be treated later in this chapter.

Philosophy, as now surveyed, in both its rational and revealed provinces, exhibits to us a series of opposed

hypotheses and dogmas respecting the origin, development and consummation of knowledge, divine as well as human. As yet neither the hypotheses nor the dogmas reign unchallenged throughout the domain of inquiry. Neither the one nor the other alone can claim the whole of philosophy. Their reconciliation and fusion in some one comprehensive theory of science remains as that great summary problem upon which hang all the other problems which we have seen successively emerging in the special sciences, from astronomy to theology. Let it be solved adversely to the possibility of a revelation and at once that whole dogmatic section of the sciences which has been accumulating for twenty centuries would crumble into so much ancient rubbish of superstition and bigotry. Against such a solution, however, may be urged not only the enormous evidence accompanying the revealed doctrines and dogmas, but also their growing consistency with the very hypotheses sometimes arrayed against them, especially in this last general science which we are now surveying. The simple fact that we have idealistic as well as realistic divines, empirical as well as transcendental religionists, positivist as well as absolutist theologians, will afford proof that when the hypothetic and dogmatic portions of philosophy shall have been sifted down to their ultimate elements of truth they will appear harmonious and reciprocal in one logical theory of knowledge as produced by revelation no less than reason. It may be well, however, to amplify this statement.

In the first place, a theory of revelation is needed in order to complete the special sciences. As we have seen, their historic contents embrace certain revealed doctrines as well as rational theories in respect to the various classes of facts with which they deal. These revealed doctrines are at least scientific or intellectual phenomena which must be exscinded or explained; and they cannot be explained by being simply ignored as unscientifical or vaguely assailed as anti-scientifical. Some of them, especially in the lower sciences, have been displaced by more scientific opinions; but only displaced, not destroyed; removed to their right place in the scientific organism, not extirpated. Others, which are in the higher sciences, still hold their ground

as scientific hypotheses no less than as religious dogmas. All of them, indeed, contain essential truths and facts of scientific value, however much their dogmatic statement may yet be modified by science itself. Astronomy, for example, while it has dispelled certain church dogmas concerning the solar system, has not touched the essential doctrine of a Creator of the heavens and earth, but still requires that doctrine in its last researches for its own logical support and completion. Theology, likewise, even as a mere empirical science of natural religions, could not be complete without testing the claims of revealed religion in the light of all the circumstantial evidence of universal history, to say nothing of its own internal evidence. Moreover, logically as well as practically, revealed doctrines are conjoined with rational theories by the great body of scientific men. They may not always think it in good taste to obtrude such doctrines into physical investigations, and sciolists may sometimes misinterpret their reserve as doubt, and construe their very reverence into scepticism. But it is conceivable that revealed truths, now treated as the antiquated dogmas of professional divines, may yet have a value for even scientists in their extremity; and the time may come when it will be good logic, as well as good taste, to recognize their claims wherever they assert themselves in any of the sciences.

In the second place, a theory of revelation is needed for the completion of philosophic science. Like the special sciences it includes historically a revealed as well as rational content, a doctrine of divine as well as of human knowledge. And this doctrine cannot be set aside as anti-philosophical or pseudo-philosophical merely because of its abuses and extravagances among theologians and divines. For at least twenty centuries it has lived and grown through all the schools of philosophy, moulding them as well as moulded by them. It enters as a strictly philosophic problem into any complete theory of the knowable and aids the whole philosophic procedure towards perfect knowledge. To the agnostic positivist it opens an avenue beyond consciousness into the otherwise unknowable, and to the gnostic absolutist it affords data for sustaining and fulfilling his otherwise empty specu-

lations. Consistently, indeed, if unavowedly, it is retained by philosophic minds in every philosophic school; and sometimes it has been thoroughly excogitated on philosophic grounds and from none but the most philosophic motives, as a part of a complete theory of cognition. Mr. Shadworth Hodgson has no doubt thrust at a grave abuse, under the epithet, "Church Philosophy," when he deprecates lending the sanction of the sacred name of philosophy to the foregone conclusion of a definite and supernatural revelation. And devout thinkers often feel with him so strongly that they consent to couch the most sacred realities in philosophical terminology, until their fastidiousness is mistaken for irreverence or treachery. But on the other hand it is quite possible that the most unchurchly thinkers might be impelled even by his own philosophy toward that very conclusion from which they recoil as a mere traditional prejudice. More even than the dogmatic narrowness of some divines is to be regretted the unphilosophical reserve of certain philosophers concerning the very highest problem of philosophy.

In the third place, a theory of revelation is needed for the completion of metaphysic science. As coextensive with the special sciences, and itself a chief section of philosophic science, metaphysic science, as we shall find, includes a body of revealed truths as well as rational speculations concerning the origin, development, and destiny of the phenomenal universe. And these revealed truths are involved logically, as well as historically, in nearly every metaphysic school and system. Because they have a pre-eminently moral and religious significance for theologians and churchmen, it does not follow that they can have no meaning or value for the metaphysician. As a matter of fact, knowingly or unknowingly, metaphysicians have often discharged them of all dogmatic import, and in the cold, dry light of pure thought viewed them as mere psychologic ideals or ontologic entities. The absolute Ego of Fichte, the infinite Mind of Schelling, the eternal Reason of Hegel, even the primordial Will of Schopenhauer and the unknowable Absolute of Spencer are but the ghosts of revealed realities, and through revelation alone could they acquire full body, life and power, either in science or in religion. Without

revelation a large province of metaphysic would be what it seems to many minds, a mere realm of phantasms and notions. In a word, so long as philosophy embraces both the metaphysical and empirical section of the sciences, together with their rational and revealed contents, it must involve not only a theory of knowing and a theory of being, but also a theory of revelation.

It is very true that a theory of revelation will be based upon the metaphysical presupposition of theism in some form and upon such metaphysical ground it must stand or fall; and therefore to that problem of theism we now proceed in the next section.

SECTION II.

Metaphysic Science.

Metaphysic science is usually defined as the science of existence and often divided into General Metaphysic or ontology, the science of absolute being, and Special Metaphysics, including the philosophy of nature, the philosophy of mind, the philosophy of art, of jurisprudence, of religion. From the time of Aristotle, metaphysic has been a recognized portion of philosophy and since the Reformation it has been passing through the stages which we have traced in all the sciences.

In its rational province, during the first historic stage, efforts were made to disentangle it from the subtleties of the scholastic divines. It was the time when emancipated thinkers were sifting and testing anew the traditional distinctions between essences and accidents, thoughts and things, and probing afresh the perennial problems of absolute existence, causality and infinity, so long treated as theological dogmas rather than as metaphysical entities. As early as the fifteenth century, the Dialectic of Plato and the First Philosophy of Aristotle were revived outside of the cloister in the great schools of Florence and Padua, and thus brought into living connection with the new metaphysical thought of the modern world. Lord Bacon then, for the first time, sharply distin-

guished the provinces of physics and metaphysics, assigning to the former the investigation of material phenomena and forces, and reserving for the latter the inquiry into essential forms and final causes. René Descartes began the work of constructing metaphysical science, in the region of psychology, by defining the soul as a thinking substance or essential reality manifested in consciousness. Benedict Spinoza followed, in the region of theology, with his definition of God as the one absolute substance, of which all other existences are but modifications. Godfrey Leibnitz, in the region of cosmology, carried the notion of active substances, infinitesimal forces, metaphysical points, throughout the sensible world. Christian Wolff, then traversing the entire region of ontology, with encyclopædiac range, systematized the three metaphysical sciences of Descartes, Spinoza and Leibnitz, propounded their various problems, and endeavored to solve them by means of demonstrative reasoning. At length, Kant, as the greatest of metaphysical critics, by distinguishing between phenomena and noumena, between the subjective ideas and the objective realities of God, the soul and the world, performed the important service of detaching ontology from phenomenology, or metaphysical from empirical psychology, cosmology and theology, leaving the metaphysical no other support than his so-called practical reason. And since that time, in spite of his protest against all future metaphysics, a host of acute thinkers, such as Fichte, Schelling and Hegel, Herbart, Beneke and Lotze, Schopenhauer and Hartmann, Ueberweg, Trendelenberg and Ulrici, have been striving to construct a scientific ontology, or theory of absolute and infinite being, as regulated by logical and empirical laws.

Meanwhile, in the second separative stage, the revealed doctrines of the trinity, the incarnation and the atonement have been gradually ignored or superseded by various hypotheses concerning the origin, development and destiny of the universe, considered as embracing both man and nature and involving the realities of the soul, the world and God.

Monism and Dualism.

As to the first of these problems, the origin of the universe, there have been the two rival opinions of dualism and monism. According to the former, all existence has originated in two distinct principles, the one spiritual and the other material. It had been held by the followers of Zoroaster and the Magi, that the mixed state of things in the world is due to a good and an evil principle, Ormuzd and Ahriman, in conflict throughout the whole creation. The Greek philosophers, Anaxagoras and Empedocles, had also sought to trace the physical universe to active and passive principles, such as mind and matter, love and hate. The Gnostics, in the second century, and the Manichæans, in the third century, combining the Persian dualism with the Hebrew doctrine of good and bad angels, had regarded God and chaos, Christ and Satan, as conflicting powers in creation; and even Lactantius went so far as to represent the two latter as the first and second-born son of the Father, the right and left hand of God. Though the opposite dogma, of an absolute production of all things from nothing, prevailed at length in the Christian Church, yet there were mystical sects in the middle ages, who revived the Manichæan notions of the eternity and sinfulness of matter, of a pre-existent chaos and of diabolic opposition in creation. Traces of the same view have continually reappeared since the reformation, in the writings of both Catholic and Protestant divines, who have depicted creation as ever involving a struggle between the opposing powers of light and darkness, more or less incompatible with the divine unity and supremacy. Deistical writers have also striven to place the world and God in a state of mutual independence. And with the extraordinary growth of speculative thought in our day, the notion of a dual origin of things has been assuming more scientific guises.

It has appeared in the metaphysical region of the physical sciences. Leading physicists and chemists, with more or less metaphysical purpose, have maintained a duality of matter and force known as dynamism. Newton, though an atomist, could only conceive of force as an expression of

mind, of some voluntary agent imparting it to the ultimate atoms of matter in the form of attraction, repulsion and other occult energies. Leibnitz regarded the atoms themselves as intrinsically active substances termed monads. Boscovich, in his dynamic theory, treated them as metaphysical points or centres of attraction and repulsion. Dalton, Herschel and Clerk Maxwell have retained similar views. Leading biologists also have maintained a duality of matter and life known as vitalism. In the earlier speculations upon organized beings there had always been supposed some immaterial principle or cause of life, such as the psyche of Pythagoras, the archæus of Paracelsus and the anima of Stahl, who went so far as to imagine that it unconsciously moulds the body and presides over all its functions. Berthez termed it the vital principle or vital force, to distinguish it from the physical and chemical forces which govern inorganic matter. Bichat lodged it in the animal tissues under the name of the vital properties. Buffon endeavored to discriminate between organic and inorganic molecules, the former composing dead or lifeless matter, and the latter animate or living matter. And Lionel Beale still adheres to similar opinions in his speculations upon protoplasm or the matter of life.

The same tendency has shown itself in the region of the psychical sciences. The chief votaries of mental science have long held a duality of matter and spirit known as spiritualism. Descartes seems to have begun this movement by distinguishing mind and matter, soul and body, as separate substances, the one endowed with thought and the other with extension, and both mechanically interacting by divine concourse. Leibnitz and Wolff substituted for the Cartesian dualism a pluralism of graduated substances or monads, both material and spiritual, whose mutual agreement, like that of two synchronous clocks, is due to a divine pre-established harmony. Kant, then, by his distinction between phenomena and noumena, maintained a dualism of the ideal and the real worlds, but left the mode of their correspondence and interaction in obscurity. And after numerous forms of idealistic monism had prevailed in Kantian metaphysics, a reaction has brought

back the dualism of Descartes and pluralism of Leibnitz. Herbart, Beneke, and Lotze, have been re-defining the soul, in distinction from the body, as a spaceless essence, a spiritual atom, a psychic force, endowed with the immaterial properties of thought, free will, and immortality; and have still farther widened the Kantian dualism by numerically separating things from thoughts, co-ordinating psychical with physical processes in plants and animals throughout external nature, and rendering even the elements and atoms sensitive and conscious. Dr. Krauth has shown that Berkeley, though holding a form of spiritualistic monism, conceded a dualism of the Infinite Spirit, as the cause of ideas, and the finite spirit receiving those ideas; and has himself recognized in the one human person a duality of soul and body, the former implicated with the latter, not like a spider in a cobweb of nerves, but as a sort of vice-creator, immanent yet dominant in its own little creation.

But the dualistic tendency has come to full effect in the region of metaphysic theology or general ontology. Theistic metaphysicians in the schools of Schelling and Hegel, protesting against the reigning pantheism, have insisted upon a grand original duality of God and the world. Christian Hermann Weisse, as a critic of Hegel and a disciple of Schelling, took for his idea of Deity a personal God, distinct from the world, yet manifested in it under the form of a trinity of nature, man and art. Immanuel Hermann Fichte, as a follower of the elder Fichte and of Hegel, in his Speculative Theology and Theistic view of the World, postulated for the absolute First Cause a rational Creator, immanent in his own creation, yet independent of it, and logically producing all things out of nothing, according to the laws of thought. Hermann Ulrici, in his works entitled Speculation and Exact Science, God and Nature, has maintained that the Creator is not only independent of His creation, but absolutely superior to it, as the one eternal author and disposer of the universe, which he both postulates as rational and develops as real. Other German thinkers, such as Chalybäus and Günther, have held that the world, so far from emanating or being produced from God, is created and maintained in

antithesis to Him by an objective exertion of his power. And some English and American writers, such as Chalmers, Martineau and Mahan, for the sake of the teleological argument in natural theology, have rashly conceded the co-eternity with God, not merely of time and space, but of matter and nature, as external and independent existences. It appears, therefore, that, in the end, an extreme dualism would co-ordinate mind and matter as two distinct essences both in man and in nature.

According to the rival school of monism, however, all things originate in but one essential principle, material or spiritual. Though the Oriental religions and earlier Western philosophies were mainly dualistic, yet gradually there grew up some purely spiritualistic theory of the world, such as that of Parmenides, who identified being with thought; or some exclusively materialistic theory, like that of Epicurus and Lucretius, who held that the entire universe, including both animate and inanimate things, souls as well as bodies, and even the image-like gods themselves, had arisen by a fortuitous concourse of atoms, as the result of endless compositions and recompositions of the original particles of matter. Among the fathers a Tertullian may have attributed a refined corporeity to God, and among the schoolmen a John Erigena may have ascribed a divine ideality to the world; while an Amaury and Dinant, by identifying the Creator with primordial matter, may have broached a sort of materialistic pantheism. But it was not until the Reformation that Gassendi began that materialistic movement, and Spinoza that pantheistic movement which led to the extreme forms of monism in our day.

In physical science the tendency has shown itself as a reaction from its opposite. The duality of matter and force has been renounced by modern atomists, such as Moleschott and Büchner, who have revived the crude materialism of Democritus and D'Holbach, and are maintaining the properties of attraction, repulsion and affinity to be inseparable from the particles which manifest them, and, indeed, inconceivable without them, according to their maxim, "No matter without force; no force without matter." The distinc-

tion between dead matter and living matter has also been disappearing from the view of some recent biologists, as one vegetal and animal process after another has been referred to purely physical and chemical laws. Professor Huxley lately maintained that protoplasm, the original organic matter of all living beings, is composed of the same atoms as ordinary lifeless matter, and differs from it only in the manner by which they are aggregated; so that there is no more reason for explaining vital phenomena by a supposed principle of vitality than to speak of aquosity as a cause of water. It is claimed that organic processes, such as digestion, can be artificially imitated, and even that living beings may be produced by chemical experiment.

In psychical science the same tendency has appeared in diverse directions. On the spiritualistic side, since Berkeley maintained the existence of nought but percipient minds, the various schools of idealists have been striving to reduce material properties, light and heat, gravity and figure, even time and space, into mental activities, perceptive and conceptive, until they have lost sight of all matter in mere mind. But at the same time, on the materialistic side, since Locke suggested the possibility of cogitative matter, the different schools of sensationalists have been referring the same properties to sensible objects and resolving sensation, reflection, volition, the mental faculties themselves, into material processes, nervous and cerebral, until they have lost sight of all mind in mere matter. And with the duality of reason and sense has at length wholly vanished the fundamental distinction between body and soul, as the new school of physiological psychologists has sought to blend the laws and processes of the one with those of the other. Maudsley has defined the mind as a mere natural force, like any chemical force in the organism. Husche has likened the relation between thought and the molecular movements of the brain to that between color and the vibrations of ether. It was a motto of Feuerbach, "Without phosphorus, no thought." Huxley has merged the will in the animal automatism as mere potential energy. And Vogt has classed the moral feelings and faculties as bodily organs and functions.

But it is in the realm of general ontology that the monistic tendency has reached its climax. Whilst the pantheistical disciples of Schelling and Hegel have been unfolding a sort of universal idealistic monism, a class of atheistic metaphysicians has reached a corresponding species of materialistic monism by deriving the totality of existence from matter alone as the sole original substance of the universe, and the grand duality of God and the world has been abandoned and lost. Schopenhauer and Feuerbach have resolved the very idea of deity into a mere phantasm of the brain or illusion of sense. Büchner, in the baldest way, has advocated the infinity, eternity, and indestructibility of matter, and treated all forms of existence, both animate and inanimate, as its mere fatalistic combinations. Strauss has declared that idealism and materialism are a mere quarrel about words, both having a common foe in that Christian dualism which has so long opposed the soul to the body, time to eternity, and an eternal Creator to a created and perishable universe. And thus an extreme monism would merge together all forms of mind and matter in some one absolute principle pervading both man and nature.

In spite of such extremes, however, both Monism and Dualism still assert themselves in new guises and with more or less opposition or agreement. In Germany, where Haeckel, Zöllner and Noiré oppose dualism from different points of view, Hertling, Otto Vogel and Busolt have been assailing the mechanical, the materialistic and the pantheistic forms of monism; whilst Mauritz Carrière has advocated a species of panentheism, or one all-enfolding Being, as consistent with unity in nature and morality in man. In France, on the dualistic side have appeared the dynamism of Cournot, the vitalism of Bernard, the new spiritualism of Vacherot and Ravaisson, and the teleological theism of Janet, Naudin and Pressensé; whilst on the monistic side Taine and Ribot have pursued English and German empiricism in psychical science, and Binet and Richet in the new realm of animalcule psychology are tracing the growth of protoplasm from chemical irritability into intelligence. In England Frankland and Clifford have broached a spiritualistic monism termed

Omnisentiency, or universal mind-stuff; "Physicus," in his candid examination of theism, has advocated a materialistic monism, arguing against the hypothesis of mind in nature, that the cosmic harmony results necessarily from the laws of persistent force and indestructible matter; "Scotus Novanticus," in his work on new and old metaphysic, has advised a return to the dualism of subject and object, as seen in a phenomenal universe existing independently of the immanent universal reason; Dr. Ward has based his "Philosophy of Theism" upon necessary and moral truth as implying a necessary and moral Being; Prof. Martin Herbert has included among the realistic assumptions of modern science mind, efficient causation and theism; Dr. Martineau has vindicated theistic dualism; Dr. Flint has probed incisively the anthropomorphism of personified atoms and powers in physics as worse than any anthropomorphism that appears in theology; and Dr. Calderwood has shown the distinctness of mental phenomena, such as thought, emotion and volition, from cerebral phenomena. In America, Mr. Stallo has exposed the concepts and theories of modern science as vicious metaphysics interfering with true empiricism; Dr. McCosh has expounded a spiritualistic psychology of the feelings and cognitions, howsoever conditioned by physiology; Dr. Cocker has included, in his "Theistic Conception of the World," an absolute Person in opposition to absolute idealism and universal materialism; and Prof. Harris has sought a philosophic basis of theism in the human or finite reason as reflecting an infinite or divine reason throughout nature. While the German *Philosophische Studien* leans toward spiritualistic monism, and the French *Revue Philosophique* toward materialistic monism, and the English journal, *Mind*, toward spiritualism and dualism, the German-American magazine, *The Open Court*, edited by Dr. Paul Carus, is the organ of a subtle form of cosmic monism, or impersonal order of the universe, termed entheism. Amid such a multiplicity of schools and opinions it remains to be seen whether the unity of the world may not still be found consistent with the duality of subject and object, mind and matter, Creator and creation.

Evolutionism and Creationism.

As to the second great metaphysical problem, the development of absolute being, there have arisen the two rival schools of creationism and evolutionism. According to the former, the whole universe, both spiritual and material, has proceeded from Deity, by successive acts of creation. It was the dogma of the ancient and mediæval Church, from Augustine to Aquinas, and also of Protestant as well as Catholic divines, that the heavenly or angelic and purely spiritual world was first created, and afterwards the earth or purely material world; and then man, with a dual nature, partly material and partly spiritual, and that ever since plants, animals and men have been produced and sustained by distinct acts of divine power, wisdom and goodness. And this dogma, in the progress of modern thought and research, has been cast into scientific forms as a metaphysical theory of the world, from its origin to its consummation. Descartes, Leibnitz and Samuel Clarke, have been followed by hosts of speculative theists, in referring the universe to an infinite and absolute person or Spirit, whose power, wisdom and goodness are manifested, throughout nature and history, in cumulative stages of creation and providence. Newton, Herschel, Clerk Maxwell and numerous other devout physicists, have regarded all forces and atoms throughout the inorganic world as the subordinate agents and manufactured articles of a Creator, whose will is the primary source of all mechanical and chemical energy, and whose mind is expressed in all dynamical laws. Cuvier, Agassiz and Guyot, with many other naturalists, have treated all vegetal and animal species, throughout the organic world, as archetypes or ideals, first conceived by God, and then successively executed, through one geological age after another, in a series ascending from the mollusk up to man, the end and climax of the whole animal creation. Bossuet, Edwards, Buchez, together with a new rising school of scientific historians, have been referring all political and religious phenomena, throughout the social world, to divine dispensations of justice and mercy, following one another in preestablished order from the Fall of Adam, the Flood of Noah,

and the Coming of Christ, to the final judgment and millennium. And thus the entire universe, material and spiritual, has been exhibited by theistic metaphysicians as a series of separate divine creations.

According to the opposite school of thinkers, the totality of existence proceeds from some primitive substance or principle, under fixed laws of evolution, embracing all mental as well as material phenomena. It was an opinion of many Greek and Roman philosophers from Democritus to Lucretius, that the original atoms or particles of matter, combining and re-combining in mathematical proportions, have successively given rise to the solid forms of minerals, plants and animals, the more ethereal souls of men, and even the visionary gods themselves, sitting aloft as indifferent spectators of the ceaseless ebb and flow of nature. And though such opinions were superseded in the Christian Church, or but occasionally blended with pantheistic views of creation and providence, yet in the progress of modern science, they have begun to acquire the pretensions of a metaphysical theory of the entire development of the universe, through all its material and spiritual stages. Spinoza and Boehme have been succeeded by idealistic pantheists, such as Schelling and Hegel, aiming to unfold the sum of existence, nature, humanity, deity, out of absolute reason, under logical laws, from the emptiest notion of nothing to the fullest idea of existence. Gassendi and Hobbes, as restorers of the ancient atomism, and Leibnitz and Boscovich, as forerunners of the modern dynamism, have been followed by materialistic atheists such as Büchner, Vogt and Strauss, maintaining the absolute infinity and eternity of matter as ever combining and re-combining under its present forms; and by mathematical physicists, such as Grove, Mayer and Helmholtz, advocating a gradual correlation and conservation of force in the nebula, the sun and the planet throughout the inorganic universe. Lamarck, Goethe and Monboddo have been followed by speculative naturalists, such as Bastian, Darwin, Haeckel and Cope, who argue for a continual evolution and survival of species throughout the organic realm, among plants, animals and men, from the

lowest up to the highest forms of life. Vico, Turgot and Herder have been succeeded by scientific historians, such as Buckle, Draper and Quetelet, who hold that nations, races, the whole human species proceed under periodic and progressive laws in art, science, politics and religion, from the rudest stages of barbarism up to the most refined forms of civilization. At length such special views, by a class of atheistic or non-atheistic metaphysicians have been gathered into the imposing picture of a universal and perpetual evolution. Herbert Spencer is endeavoring to trace the development of all phenomenal existence from persistent force, under a law of progressive heterogeneity, from the atom up to the orb, and from the animalcule up to the commonwealth. Professor Huxley declares that the whole existing world once lay potentially in the cosmic vapor; and that from a knowledge of the properties of its molecules, it would have been possible to predict the present state of the British flora and fauna, as easily as one might tell what would happen to the vapor of the breath on a winter's day. Doctor Tyndall has not only admitted that all our politics, art and philosophy may thus have been latent in a fiery cloud, but has recently startled scientific as well as religious circles by proclaiming, from the chair of the British Association, that in the original matter of the world he beholds the promise and potency of every quality of life. And thus the entire course of the universe, by the extreme evolutionists, would be exhibited as one continuous development without divine forethought or intelligent design.

The great battle between Creationism and Evolutionism still goes on with varying signs of settlement. While German thinkers attempt chiefly the problem of harmonizing the physical with the logical development of the universe as projected by science and philosophy, English and American writers deal largely with the more practical task of reconciling evolutionism with morality, religion and orthodoxy. In the sphere of general metaphysic, Prof. Cope has advocated a realistic evolution of the fittest as fatal to idealism. In the sphere of morality a purely empirical ethic without metaphysic has been evolved by Littré from the radical

instincts of nutrition and propagation; by Darwin, from the social propensities of animals, the altruistic gradually overmastering the egoistic; by Spencer, from an inherent social tendency to combine the individual with the general good; and by Leslie Stephen, from the tissues of a social organism ever tending to the healthy coincidence of pleasant with preservative actions; while Sorley, in opposition to the naturalistic ethic, has maintained that such an optimistic harmony of social passions and interests has no scientific foundation in the moral phenomena of human nature. In the sphere of religion, Mr. Aubrey de Vere, in his dialogue between "Proteus and Amadeus," has maintained that one divine plan pervades nature through all its transmutations from the physic into the vital and the psychic, and that to suppose the idea of this infinite scheme the product of a mere brain-cell would be as absurd as to gather the ocean into a cockle-shell. Prof. Henry J. Clark, of Harvard, has referred the origin of life and development of animals not merely to a primary creation, but to a foreknowing and ordaining Mind ever present in nature. Mr. George Ticknor Curtiss has judicially tested the theory of evolution by the principles of scientific evidence, and finds it not proven, and the essential truths of revealed religion untouched. Dr. Joseph F. Vandyke has argued elaborately that both theism and revelation are required to explain the origin of man, physical and religious, as well as of matter, force, life and mind. On the other side, in opposition to revealed religion, Prof. Kuenen has traced a purely naturalistic evolution of Judaism from polytheism to monotheism; the nameless author of the "Evolution of Christianity" claims that both religions already have become irreconcilable with modern conceptions of divinity; and Prof. Fiske has maintained that evolutionism now asserts as scientific truths of religion the twofold doctrine of Herbert Spencer and Mathew Arnold, that there is a Persistent Power, not ourselves, which makes for righteousness. Between such extremes, distinguished writers like Mivart, Henslow and Winchell, have admitted evolutionism throughout the organic world as both scriptural and orthodox; Mr. St. Clair has claimed it to be not anti-biblical to suppose a beneficent

development of moral as well as religious species; the Rev. M. J. Savage has advocated the evolution of religion as well as morality in consistency with Christian theism and hedonistic ethics; and Prof. Drummond has even argued analogically that organism and environment are concerned alike in the evolution of the batrachian and of the Christian. Although the Presbyterian Professor Woodrow, of South Carolina, has been deprived of his theological chair for teaching a partial evolutionism, yet President Patton has stated the theory as still a hopeful problem in apologetics; whilst Dr. McCosh from the first has led the creationists into alliance with the evolutionists. From present signs it would seem that the tide of controversy has turned in favor of Evolutionism in some form and degree as logically consistent with the strictest Creationism.

Optimism and Pessimism.

As to the third great metaphysical problem, the destiny or design of the universe, there are now emerging the two rival schools of optimism and pessimism. According to the former, the existing world is the best possible. Greek and Roman philosophers, from Plato to Cicero, had dwelt upon the order and beauty of the cosmos or mundus, and thus illumined somewhat the tragic fatalism of the heathen mind. Christian fathers of the East and West, from Clement to Lactantius, had exhibited the creation as beneficently designed for the good of man. Even the despairing mediæval view of the world and of life had been relieved by the prospect of a new creation, adorned with the beauty of holiness. And at length, in the wake of Protestant free thought and scientific research, began to appear the more philosophical optimism of the present day.

It was at first largely theological in its character. Campanella, among his many paradoxical opinions, had already broached several optimistic views; that God is the source of right and wrong; that evil is a mere negation, and ever overruled as an occasion of good; that famine promotes emigration, wars destroy tyrannies and heresies, and the worst crimes may benefit society; and that even error provokes the search for truth, and sin itself is but ignorance.

Leibnitz, the founder of modern optimism, in his Theodicy, maintained that an infinitely wise and good God could not but select the best of all possible worlds for creation, that evil is a necessary imperfection of the creature, and in different grades of creatures the means to a higher good. Malebranche supposed the ultimate end of the creation to have been the production of a perfect moral system before the mind of the Creator, with degrees of happiness for his creatures. Bishop Butler, whilst holding that none of the attempted solutions of the problem of evil are adequate, admitted that the virtue and happiness of creatures must be the chief end of a wise and good Creator, though the best means to the attainment of that end may not as yet be comprehensible. President Jonathan Edwards taught that the end for which the world was created, was the divine glory, which would be illustrated by the perdition of sinners, no less than the redemption of saints. Many other divines have associated orthodoxy with the notion that creation itself is a degradation, a falling short of the infinite, and that, therefore, there must be a minimum of evil in all finite creatures, as they could no more be infinite in holiness than in power or wisdom.

But the modern forms of optimism have become more metaphysical. The spirit of Leibnitz prevailed largely in German thought till the time of Hegel, who held that whatever is, is rational; that the development of the infinite is logical, and the goal of the process a triumph of absolute reason. Cousin, on the basis of the Hegelian metaphysic, maintained the whole history of philosophy and humanity to be rational, defended war as the necessary conflict of ideas, and argued that truth and right were always victorious over wrong and error; while Blasche and Rosenkrans have gone to the length of maintaining that evil itself is but the necessary contrast of good. The Italian Catholic metaphysicians, Rosmini, Gioberti and Mamiani, have repeatedly maintained that the Creator cannot but produce the best possible worlds, as from a casket of golden coins can only be drawn golden coins; that the development of nature, mind, and religion itself, is logical; and that evil ever diminishes as the finite

approaches the infinite, in the progressive union of which the creation finds its highest end.

At length, however, the most recent optimism has been forced into an apologetic position. The rise of subtle forms of pessimism in Germany has provoked attacks upon their metaphysical premises. Dr. Fichte, in his "Theistic View of the World," endeavors to vindicate a true optimism against modern pessimism, by tracing the root of evil to the necessary independence and possible degeneracy of creatures, and by showing its perfect remedy through a general and special Providence. Dr. Volkelt, in his studies on the Philosophy of the Unconscious, traces the recent pessimism to the Hegelian doctrine of universal development through contradictions, the negative and positive sides of which have been produced by Schopenhauer, with his doctrine of absolute will; and by Hartmann, with his doctrine of co-ordinate will and reason; and then brought into full consciousness by Bahnsen, with his doctrine of conflicting will and reason. Dr. Weygoldt, in his Prize Essay on the same subject, refers the pessimism of the age to political discontent, the decay of religious faith and hope, and generally the conflict of the actual with an ideal society as aggravated in some individuals by abnormal melancholy, and insists that its metaphysical arguments are a mere reasoning in a circle, while its ideal future can only be fulfilled by a sound optimism.

According to the pessimists, however, the existing world is the worst possible. And the opinion is of ancient as well as modern growth. The Hindoo mind, for ages, had looked upon existence itself as guilt, upon the universe as an illusion or abortion, and upon re-absorption in Brahma or annihilation in Nirwana, as the only boon of mortals, to be reached after thousands of successive births and deaths. The Greek and Roman Epicureans endeavored to drown the thought of a causeless and purposeless universe in sensual pleasure. It is claimed by modern pessimists, that the highest wisdom of the Hebrews was expressed in the dirges of Job and Solomon on the misery and vanity of life; and that Christianity itself, through its doctrine of sin, had produced a breach between God and the world, requiring the

destruction of the latter as vain and worthless. And though the fathers, excepting the Manichæans, had taken a more optimistic view of the origin and object of creation, yet among the scholastics and reformers, the gloomier dogmas of the Church were sometimes pushed toward that pessimistic extreme which the skeptical literature and poetry have since developed. Voltaire opened the movement with his satire upon the optimism of Leibnitz. Byron gave voice to the rising tendency in his Childe Harold and Cain; Shelley in his Queen Mab and Prometheus; and Goethe in his Faust. It has been echoed in the "Lucretius" of Tennyson, the "Empedocles" of Matthew Arnold, the "Vanity Fair" of Thackeray, and consciously uttered by the Italian poet-philosopher, Leopardi, in his passionate dirges upon the disappointments and miseries of existence.

At length pessimism has reached full metaphysical expression as one of the latest results of German thought. Kant may be said to have taken the first step when he undermined the theistic arguments, especially the teleological, and urged that no theodicy was tenable. Hegel may have unwittingly admitted a pessimistic element into his theory of the world, by dwelling upon the contradictions, struggles and sorrows of the whole finite development of the absolute reason. Schopenhauer, the founder of modern pessimism, consistently with his atheistic idealism, then represented the Kantian noumenon, as the will; and accepted the world as a mere visionary phenomenon of blind universal force, without rational cause or purpose, and only worthy, therefore, of a sort of conscious annihilation, or continuance under protest. Hartmann, combining Schopenhauer with Hegel, now finds the root of the world in unconscious force and reason, with the latter triumphing over the former throughout nature and history, and ending in a sort of ultimate redemption, which serves only to alleviate individual misery, with illusive strivings after a happiness unattainable in this life or in the next. Julius Bahnsen, defiantly advancing with Hegel beyond Schopenhauer and Hartmann, declares that the conflict of reason and force is both universal and irreconcilable, that absolute purposelessness reigns in the midst of apparent

manifold design, and that one world-period logically follows another only as a corpse breeds vermin, making life a hell from which there is no outlet, and dull resignation, the only philosophy.

The two voices of Optimism and Pessimism, sometimes blending in Meliorism, may now be heard through all modern literature. Hartmann has distinguished three forms of temperamental or constitutional pessimism: the passionate, which blindly rages at the miseries of the world; the quietistic, which pensively reflects upon them; and miserabilism, which grumbles at them without alleviating them. A pessimistic strain has been discerned in the Niebelungen of Wagner, who was a disciple of Schopenhauer, and in the mystical writings of Nietzsche on the ultimate extinction of good and evil. Whilst Frauenstädt has associated it with atheistic infidelity, Mainländer has argued that the philosophy of Christian redemption requires the final resolution of the abortive universe to nothingness as not willed by the Creator. Klencke has advocated a hedonistic realism or meliorism of Spinoza in opposition to the pessimism of Schopenhauer; Dühring and Gans have maintained that the worth of life arises from a rhythmic development through the antagonisms of hate and love, joy and sorrow, life and death, towards higher kinds of happiness, between the extremes of pessimism and optimism; but Frau Plumacher, against the recent naturalistic, ethical and panlogistic forms of optimism, has argued that the eudæmonical pessimism of Hartmann, or future happiness of humanity through the deliverance of the Absolute Spirit, must be the final philosophical doctrine as distinguished from all forms of unreasoned optimism or pessimism. M. Caro has referred modern pessimism to the destructive march of the critical philosophy against the metaphysical ideals of God, duty, personality, progress itself; has traced its logical outcome in the socialistic nihilists and a revolting sect of philosophical celibates; but has maintained that it is only a transitional illusion, out of which humanity will awake more vigorous and hopeful than ever. Mr. James Sully, after giving a literary history of pessimism, criticises the doctrines of Schopenhauer and Hartmann and advocates

a gradation of interests involving a hedonistic meliorism, which shall not only seek to lessen human ills but have power to increase the sum of human happiness. Mr. J. M. Barlow states the ultimatum of philosophical pessimism to be the delivery of the Absolute from transcendental misery by means of evolution towards a perfected humanity. Mr. R. J. Lloyd, treating English pessimism as a study in contemporary sociology, describes it as a disease of advanced thinkers who intellectually, morally and æsthetically, are ahead of their contemporaries. Mr. E. P. Aveling takes an optimistic view of the value of life, in reply to Mr. W. H. Mullock, who had argued that life would not be worth living but for morality and religion. Mrs. Jane Hume Clapperton advocates scientific meliorism by means of such a conscious social evolution as will remove the ills of poverty, labor, crime, marriage, fashion, and false theological ideals. Dr. Paul Carus, of Chicago, deduces a form of ethical meliorism from his theory of entheistic monism. The airy pessimism of Edgar Saltus is literary rather than philosophical. If Asiatic pessimism can be said to find much that is congenial in European philosophy, especially in the Buddhistic dreams of German idealism, American culture, being young and progressive, may be claimed to have a more optimistic or melioristic tone and tendency.

The rational province of metaphysic is thus found to contain groups of rival speculations concerning the origin, development and destiny of the intelligible universe. Dualism, creationism, optimism stand opposed to monism, evolutionism, and pessimism. Between these speculations metaphysicians are divided into hostile schools. While neither can be pronounced wholly erroneous, there are elements of truth in both, which may be susceptible of combination.

On the one side, the whole static view of the universe favors creationism. Gradation seems to be the law of all extant being, suggesting a series of abrupt creations one upon another. In the material world we find a perfect scale of distinct species, orders and genera, ascending from the simplest to the most complex organisms, without mixture or confusion, the mineral ministering to the vegetal, the vegetal

to the animal, the animal to man as a microcosm in whom are recapitulated all the means and ends of inferior nature. Taking physical man as a stepping-stone we rise through a higher series of gradations in the spiritual world, in which individuals appear subordinate to families, families to nations, and nations to races, all separate yet mingling in the general life of humanity. And then mounting above humanity by analogy we may imagine a hierarchy of other worlds and creatures, remote in space and different in structure, solar and stellar orders, rank above rank, increasing in power and glory as but successive creations of the one Supreme Creator.

On the other side the whole dynamic view of the universe favors evolutionism. Development would seem to have been the law of all past being, requiring one continuous evolution or course of evolutions of lower into higher forms of existence. So far as science has traced the physical history of our globe, nature appears to have sacrificed innumerable individuals in perfecting every species and whole species in completing each genus, first entombing successive strata, then fossilizing successive floras, and at length after a series of extinct faunas producing man as the flower of the whole organic process. Starting afresh in human history, we see that countless families and nations have perished in the social evolution, whole races have been cast off as but dross of a growing refinement, and vast civilizations must yet flourish and decay, like the primeval floras, ere the planet can blossom with consummate sciences and arts. And then in the universal history, if other orbs and races be spiritually as well as materially linked with our own, we may fancy a terrestrial ideal giving place to a solar, and a solar to a stellar, until the whole ripened cosmos dies back into chaos thence to bloom into some new cosmos again. Thus it may be that the history of nations merges in the history of races, the history of races in the history of humanity, the history of earth in the history of worlds, the history of suns and systems in the history of the universe, until at last the history of the universe is lost in the history of God.

At the same time, from a higher point of view, the elements of truth and reason in both speculations appear by no means

irreconcilable. Creationism may not be wholly inconsistent with evolutionism. Evolution may be but half the method of creation. Progress through succession, creation with re-creation, may be the grand summary law of all being, past, present, and to come. Nature may be ever destroying, yet renewing, advancing though receding, as in a winding stair, with fresh impulse and purpose, each lower ideal serving as the step to a higher, and towards the highest. Throughout the scale of forces, physical, chemical, organical, psychical, social, religious, there may be but the steady conservation and expenditure of one omnipotent Will in which they all have their source. The birth and death of plants, animals, and men, the rise and fall of races, empires and civilizations, the genesis and apocalypse of planets, suns and galaxies, the waxing and waning of the whole cosmos itself, may be but so many realized ideals of one infinite Intelligence. In a word, the universe may be but the ever-evolving, ever-dissolving creation of an immanent yet independent Creator.

In like manner the two tendencies when blended will issue in a doctrine of meliorism as to the worth of existence. Pursue evolutionism alone and a false pessimism logically follows. The universe will seem to be developed from irrational force or impotent reason, at once causeless and aimless in all its manifold phases. Throughout nature we shall see but one long fierce struggle of life against death, plants and animals surviving only by destroying each other. Throughout history we shall find only the traces of fading races, falling empires, forgotten civilizations. If we rise above our planet, among the vaster evolutions of other worlds, the earth with all its splendid works and annals will dwindle into an ant-hill beneath the heel of fate; the countless orbs will seem insignificant as seeds that can bloom only to fade; planets, suns and stars, with all their pomp and garniture, will be ever waning into night and death. We shall reach the summit of human thought only to gain the cheerless vision of Shelley:—

> "Worlds on worlds are rolling ever
> From creation to decay,
> Like the bubbles on a river,
> Flashing, bursting, borne away."

But blend creationism with evolutionism and a true optimism must follow. Order, plan, and purpose will be found pervading the universe through all its gradations and cycles, with the ever-growing virtue and happiness of creatures, for the glory of the Creator. In the physical realm we shall behold beast, bird, and flower, each in its own sphere, fulfilling its own end, while contributing to the general good of nature. In the mental and moral realms individuals, nations, races will appear performing freely, if unconsciously, their several parts, under a benign Providence, in the progress of humanity. Though empires rise and fall, though civilizations flourish and decline, we shall trace through the rolling cycles a steady triumph of reason over force, of virtue over vice, of religion over superstition. Though generations must perish, we may hope individuals shall survive with immortal youth in the ethereal sphere. Though the earth itself decay and planets and stars die out in night, we may fancy the emancipated race joining other intelligent hierarchies that move onward, rank above rank, toward light inaccessible, in harmony with the Eternal Reason. In spite of all the anomalies and miseries incident to a universe unfolding, from the reptile to the archangel, we can still cherish the hopeful faith of Tennyson:—

> "Yet I doubt not through the ages one increasing purpose runs,
> And the thoughts of men are widening with the process of the suns."

It is only when creationism and evolutionism are driven asunder that they will end in some extreme form of optimism or pessimism; and only then, too, will they fail of any point of contact with those revealed doctrines and dogmas which also form part of metaphysic science in the province next to be surveyed.

Doctrine of Revealed Being.

In the revealed province of metaphysic science we find gradual departures from the strictly rational theology and theory of the world. In the first historical stage, efforts were made to extricate revealed divinity from the false metaphysics of the middle ages. Luther, Melancthon, Calvin, and

other learned reformers led the way, by their attempts to reconstruct theological science upon a scriptural basis, free from patristic and scholastic conceits concerning the mysteries of the trinity, the creation and the atonement. Buddeus and Mosheim in Germany, and Henry More and Cudworth in England, followed with their more positive efforts to support Christian theism with the metaphysical principles which the new Protestant thought was developing. Dr. Samuel Clarke, as an antagonist of Leibnitz, sought to demonstrate the Divine being and attributes by speculations upon contingent and necessary existence, and also attempted a metaphysical explanation of the Trinity. Bishop Butler, in his Analogy, proposed a hypothetical reconciliation of the articles of natural religion with the theory of universal necessity, and even exhibited the great central doctrine of redemption as but the highest expression of divine principles pervading all nature and society. At length Dr. Christian Wolf brought metaphysical theology to a crisis with his attempts to resolve the most peculiar doctrines of the Christian religion into philosophical tenets, upheld by demonstrative reasoning. And since then, each succeeding school of German metaphysics has had its wing of speculative divines, such as Schleiermacher, Marheinecke and the younger Fichte, endeavoring to identify the Absolute as Jehovah, to retrace creation as a logical process, to reconstruct the trinity as a trilogy, and thus establish the coincidence of the rational with the revealed theology and cosmology.

At the same time, however, by the great mass of orthodox divines, the distinguishing dogmas of revealed religion, the trinity, creation, providence and redemption, are still held in their traditional form, with little or no reference to recent speculations upon the origin, course, and destiny of absolute being. As to the trinity, the patristic and scholastic definitions remain substantially unchanged. The Greek Church still adheres to the Nicæan and Constantinopolitan decrees, that there are three persons in one Divine being, the Father, the Son and the Holy Ghost; that the Son is of the same, and not merely of like essence with the Father, and that the Holy Spirit proceeds from the Father alone. The Roman

and Anglican Churches retain the same symbol, with the added clause, "filioque," adopted by the third synod of Toledo, declaring that the Holy Spirit proceeds from the Father "and the Son." The principal American Churches also hold the trinity; and it still characterizes the whole Christian world with the exception of the Unitarian bodies which have revived the opinions of Arius and Socinus, that Christ is but the noblest of creatures, or a mere man, and the followers of Swedenborg and Zinzendorf, who have departed from the traditional view of the relationship of the three divine persons.

As to the dogmas of creation and providence, a like agreement prevails. Greek and Roman authorities still follow the fathers and schoolmen in maintaining that God, the Father Almighty, has created the world from nothing, through the Son, as His expressed reason or logos; that the creation, as it came from His hand, was perfect and pure, and that by the sin of the creature alone it was marred and perverted, and not through any mere necessary defect or privation without moral quality. The Reformed Churches seem to have only emphasized such views of the creation, and re-defined with more clearness the doctrine of Providence as being a continued manifestation of the triune Jehovah in the preservation and government of the world, both general and special, consistently with occasional miraculous suspensions of natural laws, as well as with the freedom and responsibility of the human will. As to the doctrine of redemption, there is scarcely less agreement among orthodox divines. While some may distinguish the divine glory, and others human happiness as the end or design of the Father in creation, all concur that both objects are achieved through the incarnation, atonement and ascension of the Son, and by the ministry of the Holy Spirit, and that the great consummation will involve the abolition of sin and death, and the regeneration of man and nature; if not also the final restoration of all fallen creatures, by the Spirit and through the Son, into unison with the Eternal Father.

Metaphysic science, as now surveyed in both its rational and revealed provinces, presents to us a series of antagonistic

speculations and doctrines concerning the origin, course and object of the world, as related both to man and to God. But neither the speculations, nor the doctrines as yet have gained exclusive supremacy. To sift out and blend their common truths is that final problem which involves all the other problems which we have been unfolding in the special sciences, as well as the summary problem of a revelation. Prove that there can be no God to reveal himself or be revealed, and the whole dogmatic side of philosophy becomes palsied at one blow and our theory of knowledge must shrink into our narrowed theory of being. Foremost against such a conclusion stands the plain fact that the dogmatic and speculative spheres of metaphysic are already intersecting, if not coincident. We have Christian monists or pantheists as well as Christian dualists or deists; we have orthodox evolutionists as well as orthodox creationists; and we have pessimistic as well as optimistic divines even under the same creed and in the same churches. That this practical concurrence is destined to become logical may be shown by several considerations.

In the first place, there is no presumption against the theistic theory of the world as transcending consciousness and embracing absolute existence. Unless we should presuppose all being to be incognizable, we could not preclude a Divine Being from the process of cognition. Mr. Shadworth Hodgson consistently retains the mere ideal of a Divine Being among the phenomenal contents of consciousness, because he holds that we have no direct perception of any being whatever beyond consciousness, but can only reflect upon its phenomenal presentations in consciousness, and that such an ideal God is not a strict necessity of thought, but simply a problem in metaphysics. On the other hand, as great a metaphysician, Prof. Ferrier, has maintained that consciousness itself involves being as well as knowing, as a mind in synthesis with things, and leads necessarily to the conception of a conscious God or Infinite Mind in synthesis with the universe. Without taking either of these extreme positions, we may at least assume the existence of a Divine Person within or without the purview of consciousness, just

as we assume the existence of other human consciousnesses or persons like ourselves; and then proceed to inquire what evidence we have of the existence of such a Divine Person, and how far this personality may be like or unlike our own.

In the second place, there is no presumption against the theistic theory of the world as being anthropomorphic, derived from human personality, or howsoever derived, conceived in analogy with such personality. So long as we stand before the veil of absolute reality with no power of passing behind it, it is easy to assert that divine personality is a mere adumbration or reflection of human personality; but it is quite as easy to assert the converse, and the assertion is more likely to be true. It is one thing to say that we have made God in our own image, but another thing to say that we ourselves have been made in the image of God. On the latter assumption, the divine macrocosm would be mirrored in the human microcosm as the cope of heaven in a drop of dew. A pure anthropomorphism would be the epitome of a pure theology. It would be based upon the known analogy between ourselves and other persons within the purview of our consciousness. To reject such analogy as false and misleading you would need first to show that all external reality is wholly misrepresented to us in the very process of intelligence. Not until you have proved that there is no other human person may you presume that there could be no divine person.

In the third place, there is a positive presumption in favor of the theistic theory of the world as at least logically conceivable. As we have seen in the former volume, it involves no contradictions and absurdities such as are charged upon it by sceptic and agnostic thinkers. Absoluteness, infinity, causality may appear to be inconsistent notions when predicated of some vague power or principle or attributed to the universe itself; but they become thoroughly logical as personal attributes of a Creator ever inhabiting and controlling the universe as his own creation. In other words, theism presents itself as a legitimate problem consistent with the laws of thought as well as of cognition.

In the fourth place, a theistic theory of the world is also

scientifically probable. As a mere hypothesis viewed in a scientific light, it explains the universe better than other hypotheses and ever holds its ground against them with increasing evidence. Such evidence may be found: 1st. In the normal constitution of reason which, whether savage or civilized, spontaneously resorts to the hypothesis of a God, and only relinquishes it through some sophisticating process. 2d. In the history of all metaphysics, which are often essentially theistic and, even when avowedly atheistic, sometimes have the formal ideal of an absolute Reason or Will or Ego, which only theism could realize. 3d. In the history of all religions which in some form and degree are still ever theistic, even after their polytheistic or monotheistic or pantheistic myths and symbols have been outgrown. To these should be added the special theistic proofs, elaborated in Christian schools, the ontological, cosmological, teleological, moral and historical arguments, which though framed from religious motives, notwithstanding any anthropomorphic ingredients, corroborate metaphysic theism as the only scientific explanation of the universe.

In the fifth place, a theistic theory of the world can alone make the world itself fully cognizable or intelligible. As we have already shown, the very course of science must logically end in a theistic ontology. By proceeding from facts to their laws, from their laws to their causes, from causes to one supreme cause, both first and final, it reaches the postulate of an Absolute Person as the source and ground and reason of the phenomenal universe. It is only when the phenomenal universe is thus recognized as a manifestation of Divine Intelligence that it can become fully intelligible to a human intelligence. Mind will then be simply retracing the course of Mind throughout nature. The sciences in their due order of development will then be merely reviewing the process of Omniscience itself in solving their own mechanical, chemical and organical problems, and in fulfilling their own psychical, social and religious ideals. In a word, the world can only be completely known as a manifestation of Absolute Reason as a divine rather than as a human cosmos.

It may be observed in passing that such a theistic theory

of the universe avoids the error while retaining the truth of the pantheistic theory. As in conceiving an Absolute Person the thinker merely thinks of himself as part of the creation of the Creator, so in cognizing that Absolute Person, the creature simply distinguishes himself from the Creator. And the universe is viewed by him neither as the necessary phenomenon, nor as the spontaneous development of mere absolute being, but as the voluntary and conscious creation of an Absolute Creator capable of evolving and dissolving creation after creation to all eternity.

True enough, indeed, it is that this Absolute Person must be cognitive as well as cognizable, revealable as well as discoverable, and more or less revealed as well as discovered, in every science and in every province of each science. And therefore the theory or doctrine of revelation remains to be considered as a complementary portion of the general science of knowledge.

SECTION III.

Theosophic Science.

Theosophic science, the knowledge at once divine and human, has so often been confounded with mysticism and even with magic, that now a certain opprobrium clings to the very name. But its true import remains still valuable after centuries of abuse and caricature, and it would be a pity to surrender the term itself, so long as we have nothing better to put in its place than the mere vague phrases which have become current, such as "Faith and Knowledge," "Reason and Revelation," "Science and Religion," "Philosophy and Christianity," and while, too, it is still an avowed aim of both thinkers and divines to ascertain and adjust the divine and human elements in cognition and in science.

If the whole foregoing discussion be valid, the theory of revelation becomes a philosophic and metaphysic as well as theosophic question, since it presupposes and involves the theory of knowing and the theory of being. As a matter of fact it has been so treated in pagan no less than in Christian

schools of philosophers and by deistical and pantheistical as well as by monotheistical metaphysicians. Often, indeed, it has been avowed more or less openly as the very cause and stake of warfare between mystical and sceptical thinkers on the battlefields of science as well as of religion.

In the former volume we have traced historically such conflicts and alliances of science and religion, considered as distinct bodies of human and divine knowledge, from the most ancient times down to the present day. It has been shown that for centuries they proceeded apart until the Christian era, when they met openly as strangers whose mutual interests were yet to be perceived and adjusted. It was not until Christianity had emerged from the symbols of Judaism that religion stood forth in a mature form, free from philosophic speculation; and it was not until Grecian wisdom had outgrown the myths of heathenism that philosophy appeared in a pure state, disengaged from religious superstition. Nor was it strange that the first meeting of the two unfamiliar powers should have resulted in misunderstanding and conflict. The early Christians, claiming a revealed knowledge from heaven, could only denounce philosophy as the foolishness of this world; and the philosophers, in their conservative pride of learning, were fain to despise the new religion as a mere vulgar imposture. The struggle had its practical issue in the bitter persecutions which prevailed until the triumph of Christianity under Constantine.

Since that first encounter the relations of religion and science have passed through various phases marked by the chief epochs of church history. In the patristic age the previous conflict became exchanged for an alliance, and the two rival interests were blended within the limits of Christian theology. The Greek fathers, Justin Martyr, Clement and Origen, strove to base their apologetics upon the theism and ethics of Plato, and even to couch the mysteries of the Trinity, the incarnation and the atonement in terms of the Platonic metaphysics. And although some of the Latin fathers, such as Tertullian and Irenæus, betrayed an anti-philosophical tendency, yet others, such as Lactantius and Augustine, did not scruple to employ the rhetoric and logic of Aristotle.

The union had its hybrid fruit in the half-pagan, half-christian civilization which perished in the fall of the Roman Empire.

In the scholastic age the former alliance grew into a bondage, and religion in its most dogmatic form subjugated philosophy to the service of orthodoxy. The chief schoolmen, such as Peter Lombard, Thomas Aquinas, and Duns Scotus, simply aimed to systematize the patristic opinions by means of the Aristotelian logic. Any more philosophic divines, such as Scotus Erigena, Abelard and Roger Bacon, who indulged in metaphysical speculations or physical researches, incurred suspicion or persecution as heretics. This despotism had its imposing manifestation in a crude christian civilization which rendered all the mediæval arts as well as sciences subservient to the aggrandizement of the papal hierarchy.

In the reforming age the former bondage bred a rupture, and science and religion once more became independent. On the philosophical side the revolt of reason appeared successively in Italian naturalism as led by Pomponatius, Cardan and Vanini; in English deism as led by Herbert, Hobbes and Hume; in French atheism as led by Voltaire, Helvetius, Diderot; and more recently in German pantheism as led by Strauss and Feuerbach. On the religious side the recoil of faith was seen in Roman Catholicism as reëstablished by Bellarmin and Loyola on the patristic and scholastic dogmas; in Protestantism as organized by Luther, Calvin, Cranmer, Knox on the reformed creeds and confessions; and ultimately in a growing sectarianism which has filled Christendom with polemic feuds to the present hour. At the same time the wonderful intellectual activity of the period has been practically expressed in a progressive Christian civilization which has resuscitated Europe, colonized America and is already pervading Asia and Africa.

At length in the present critical age the conflict has become a truce, and science and religion seem poised as for some final adjustment. By our historical review we have traced their gradual divergence through successive epochs and stages until now they stand apart, each distinct from the other, science without religion, and religion without science.

On the one side science presents an involved series of rational theories and hypotheses ranging through the whole region of empirical research; and on the other side religion presents a counterpart series of revealed doctrines and dogmas extending through the corresponding region of metaphysical inquiry. Never before have they reached a separate development so extreme. Never before have their relations appeared so problematical, and never before has the need of their reconciliation become so imperative. A few religionists may still talk of dispensing with science, and a few scientists may dream of superseding religion; but the intelligent mass of religionists and scientists, thinkers and divines, are confidently awaiting their ultimate harmony.

Without disparaging the momentous bearings of this great question upon practical religion, we should not forget that we are here concerned chiefly with its important bearings upon theoretic science. It is because a theory of revelation will be essential in any complete science of knowledge and of being, that it now comes before us and claims to be treated with as much logical rigor as can be bestowed upon any purely philosophic and metaphysic problems. If no such theory be attainable, not only will the whole mass of revealed doctrines and dogmas throughout the sciences disappear, but philosophic science will be left largely devoid of transcendental knowledge, and metaphysic science will be restricted to a universe less cognizable, as well as wholly inexplicable. But should such a theory be maintained, both philosophic and metaphysic science will become perfectible, while throughout the sciences revealed doctrines and dogmas may yet be found reconcilable with rational theories and hypotheses. In other words a theory of revelation not only requires but is itself required by the theory of knowledge and the theory of being, as heretofore maintained, and it is now needed in order to complete a science of the sciences.

As we proceed it will be found that the elements of such a theosophic theory already exist in rival schools of thought respecting three questions, the form, the content and the fulfillment of divine revelation considered as a source of metaphysical knowledge.

Naturalism and Supernaturalism.

As to the form of revelation we find the two rival schools of the naturalists and supernaturalists. According to the latter school divine revelation must be a supernatural communication, attended with miraculous evidence. At the Reformation this theory was held as a doctrine, with religious rather than scientific motives. While Roman Catholics re-defined both Scripture and Tradition as supernatural sources of knowledge, Protestants having renounced Tradition, were led to magnify Holy Scripture as an external revelation and supplement it with the witness of the Holy Spirit as an internal revelation, giving more or less miraculous power of interpreting the miraculous Book. And this Protestant supernaturalism by some sects and parties was carried to mystical and even fanatical extremes. The German mystics kindled it into a glow of pietism and devotion. Sebastian Frank, the prophet of Zwickau, and Boehme, the inspired cobbler, exalted the inner spirit above the letter of the divine word, and indulged in new revelations and ecstatic visions, which became authoritative in sects and schools which they founded. Spener, following Arndt as the founder of pietism, put the inner revelation above all dogma, claimed special illumination for lay-preachers, appealed from scholastic to biblical theology, and founded pious colleges for the devout study of scripture. Count Zinzendorf, in the same spirit, placed piety before orthodoxy and kindled a religious zeal which led to evangelistic missions in both continents.

The French mystics, as Protestants both within and without the Catholic church, sought the inner light through passive contemplation or quietism. Molinos had been condemned by the Inquisition for teaching a self-absorption in God oblivious of morality itself. Madame Guyon, when condemned by Bossuet for her sacred meditations and saintly visions, attracted the congenial defence of Fénélon. Antoinette Bourignon, a less refined visionary, published volumes of fantastic revelations, which were expounded by the Calvinist Poiret in Switzerland, imported by the pansophist Comenius into Moravia, and from the continent spread like wild-fire through Scotland. Meanwhile the disciples of John

de Labadie, a reformed mystic of Guienne, having passed from Bohemia to Amsterdam, thence emigrated to found a communal manor in Maryland.

At length the English mystics seemed to have seized and blended all these contagious influences into a flame of rapture. Jane Leade, a follower of Boehme, with the aid of Pordage and Bromley, sought to organize Philadelphian societies to be composed only of the divinely illuminated members of the churches. John Wesley, through the influence of Zinzendorf, transported the ascetic methodism of Oxford with Moravian fervor to the American Colonies, while William Law in London was adding to it all that was most inflammable in German theosophy and French mysticism. George Fox, Robert Barclay and William Penn, respectively the founder, the defender and the patron of Quakerism, putting the inner light above both Scripture and Tradition, abolished the church and the sacraments, and even worship itself, except as the Spirit might move the worshipper to utterance with divine tremors. In our own time and country such forms of supernaturalism have only been repeated and magnified. The methods of Spener and Wesley have been renewed by the revivalists Moody and Sankey. The disciples of Edward Irving have laid claim to a restored apostolate and revived miraculous gifts of tongues, healing and prophecy. The latter-day saints of Utah have found a new Bible of a new prophet in the Book of Mormon, strangely blending Judaism with Christianity in the heart of modern civilization. In its extreme issue supernaturalism is thus ever claiming new Scriptures, miracles and prophecies.

But according to the opposite school of naturalists, all Holy Scriptures or sacred books are purely human writings without miracle or inspiration. This theory, too, at the Reformation was maintained on religious rather than on scientific grounds. The Protestant principle having separated Tradition from Scripture, it was easy to separate Scripture from reason and present essential Christianity as a mere natural religion, derived from the light of nature alone. And this religious naturalism or deism, in the progress of free thought, grew more and more critical and sceptical. The

English deists gradually assailed the whole supernatural and miraculous element of revelation. Lord Herbert, though he claimed a special revelation to himself, denied a general revelation to mankind of other religious truths than those common to all nations; Sir Charles Blount sought the pseudo-miracles and prophecies of paganism in Christianity; and Hobbes accepted the Scriptures only as enjoined by the civil authority. Toland held that Christianity was not revealed, and classed the canonical books with the pseudo-gospels of the first century; Collins treated the prophecies as Hebrew allegories; and Woolston rejected the miracles as ingenious fictions. Tindal argued that a revelation would be inconsistent with the divine perfections; that Christianity was as old as creation, the gospel being a mere republication of the moral law of nature; and that the church is only useful as a mere State institution for promoting natural religion. Bolingbroke went farther and maintained that true natural religion had been actually corrupted by the Old Testament Scriptures; that it was largely inconsistent with the New Testament; and that Christ himself only taught the doctrines of Plato, so far as he taught the truth. Morgan and Chubb also assailed the Hebrew and Christian Scriptures as corruptions of pure religion and ethics. And at length Hume, with his universal scepticism sought to render the whole miraculous element of revelation improbable, if not impossible.

The French deism, as borrowed from the English, assailed the supernatural only with more wit and invective. Voltaire, as its literary champion, became the idol of courts and nobles, as well as of the populace; Rousseau invested its tenets with a glamour of morbid sentiment; Diderot infused it into the cyclopedia of science; and La Mettrie and d'Holbach degraded it into sensuality and vice. Meanwhile, by English visitors to the country of William and Mary, and by French refugees, it was imported into Holland, where Spinoza, with his pantheistic denial of miracles, and Bayle, with his sceptical dictionary had already prepared the way for it, though the Dutch sobriety did not readily yield to its attractions.

At length, under all these influences, German naturalism explained away the supernatural element altogether.

After Edelman, Bahrdt, and Basedow had championed the foreign deism with frivolity and coarseness, and Mendelssohn, Lessing and Reimarus had arrayed it in literary graces, it found more native expression in learned divines and biblical critics who sought to render it exegetically consistent with the sacred writings. Eichhorn, whilst respecting the Bible as a religious and moral classic, treated the story of creation as an historical allegory, and the prophecies as poetical rhapsodies. Paulus, assuming Jesus to have been a pure theist and reformer of Judaism, explained his miracles as mere remarkable coincidences or popular illusions. De Wette, Sieffert, and Gabler found numerous traces of the ancient mythopœic or legend-making faculty in both the Old and New Testaments, without accusing either the apostles or the prophets of imposture. And then Strauss, massing together all previous forms of naturalism, simply voiced a growing opinion of the learned world, when he expounded Christianity as mythology.

From Germany naturalism has since returned to France, where Renan has depicted Jesus as a romantic young Hebrew enthusiast, apotheosized by his followers and invested with thaumaturgic powers which modern science discredits. In Holland it has the subtle advocacy of the philosopher, Scholten, and the exegetes Kuenen and Wellhausen. In England the author of "Ecce Homo" has revived it in the form of naturalistic Christianity and enthusiasm for humanity; Thomas Sinclair has distinguished its classic humanities from Hebraic barbarism and Pauline bigotry; Matthew Arnold has opposed its literary sweetness and light to dogmatic harshness and austerity; and Mrs. Humphrey Ward has depicted its sentimental hero in Robert Ellesmere. As transplanted to the New World it has been grafted upon the Puritan stock and yielded its finest bloom in the form of Unitarian culture. Theodore Parker has fused all its coarsest phases into an absolute religion, embracing Fetichism with Christianity, and common to savage and civilized races. It is echoed in the blasphemous wit of Ingersoll. It largely pervades our lighter literature, treating bible-stories as nursery myths and stigmatizing reverence for a supernatural revelation as bibliolatry.

In its final outcome it would simply reduce all holy scripture, miracle and prophecy, to the commonest phenomena.

Nevertheless, between these extremes of Naturalism and Supernaturalism, meanwhile there have been various degrees of agreement as well as of opposition. On the one side mysticism has sometimes been brought nearer to orthodoxy. That very Roman church which condemned Molinos and Madam Guyon, afterward canonized SS. Frances de Sales and Theresa, for visions and devotions more within the bounds of church order. John Valentine Andrea wrote of his fabled Rosicrusians and Temple of the Holy Ghost so much in seeming sympathy with the German mystics that his satire was long accepted by them as a genuine revelation. The practical mysticism or pietism of Spener and Gerhard, like a church within the church, had its school of devout learning at Halle, and found defence in the ecclesiastical history of Arnold, the statesmanship of Thomasius, and the exegesis of Bengel. Moravianism lingered long as a live coal in the ashes of the following rationalism, from Semler to Schleiermacher. English Methodism spread over the continent converting its enemies into friends, among scholars and nobles as well as among the people. The evangelism of Whitefield blended the logic with the zeal of the apostle to the Gentiles on both sides of the Atlantic. And ever and anon our great historic churches are swept by Pentecostal revivals, superseding learned chairs, pulpits and pastorates with itinerant evangelists, lay-preachers, and public confessionals. The most mystical supernaturalism at times is scarcely distinguishable from orthodoxy.

But on the other side orthodoxy has often taken common ground with deism. The English apologists, Gale, Cudworth and More replying to Herbert and Blount, included all Gentile religions in Christianity as within the outer court of the Temple, and found even Christian doctrines in Greek and Latin authors. Conybeare and Butler agreed with Toland and Tindal that the Christian church might at least promote natural religion, and Butler labored through the first half of his treatise to establish the chief articles of deism on grounds wholly independent of revelation. Bishop Sherlock went so

far towards Woolston as to cite the Apostles before an imaginary judge and jury as witnesses in the celebrated case of Lazarus. The German exegetes, Ernesti, Semler and Michaelis though scorning the crude deism imported from England and France, taught its essential principle from orthodox chairs and pulpits. Whilst some opponents of Strauss, like Steudel, Dorner, Luthard and Hengstenberg, have stood as uncompromising supernaturalists, others like Neander, Ullmann, Tholuch cautiously admitted an allegorical, legendary or purely human element in the Scriptures. In like manner English apologists, like Coleridge, Trench and Jowett, have depreciated miracles for the sake of doctrines. The "Essayists and Reviewers," whilst making terms openly with the naturalistic criticism, were retained within the pale of the Church. The Scottish professor Drummond finds natural law throughout the supernatural world. American theologians, though more conservative, have modified somewhat the old mechanical supernaturalism. Dr. Horace Bushnell, in his treatise on "Nature and the Supernatural," denies that the supernatural is any distant ghostly affair, incompatible with nature or with fixed laws, and depicts man himself as no less supernatural than God. Dr. McCosh, in his early work on the "Supernatural in relation to Nature," whilst maintaining their distinctness, finds system, order, and points of analogy in them both. Dr. George P. Fisher, in his scholarly works on the "Supernatural Origin" and "Beginnings of Christianity," holds that the supernatural is not anti-natural, and that miracles simply transcend nature and experience, and are inferior to doctrines as evidence. Unitarian divines, like Hedge, Furness, and Frothingham, have departed from the rationalistic supernaturalism of Channing, Dewey and Bellows towards a purely naturalistic Christianity without miracle or inspiration. Orthodoxy, indeed, shades off by imperceptible degrees towards deism.

Now, from such a state of parties it must be evident that both Naturalism and Supernaturalism contain truth as well as error. It has been the mistake of their extreme partisans to treat them as if wholly irreconcilable, and make one of them exterminate the other. Starting from the most opposite

premises they can only reach the most opposite conclusions. On the one hand, we have the anonymous author of the learned treatise miscalled "Supernatural Religion," postulating the glorious perfection and invariable order of nature, and thence arguing that a supernatural revelation is antecedently incredible; that miraculous evidence of it is unprovable; that the testimony of the apostles would have been incompetent; that their supposed writings are but pious distortions or adroit forgeries of their followers; in a word, that no mere supernatural halo can brighten but would rather obscure any spiritual beauty and holiness which Christianity may possess. On the other hand, in reply to this treatise, we have Dr. Reynolds, in his work on the "Supernatural in Nature," assuming that the supernatural is of the very essence of religion, without which there can be no deity and no morality, and that nature itself is but a revelation of the supernatural as presented in consciousness and verified by the sciences; and we find Prof. Birks, in his treatise on "Supernatural Revelation," maintaining that even the interposing miraculous element is involved in the whole course of nature as well as of revelation, not less in the physical than in the moral realm, as much needed to supply the failing heat of the sun as to unfold the Christian scheme upon earth. Both extremists have not only overlooked their large common ground in natural religion, but have taken antagonistic positions whence each can see but one side or phase of revealed religion, and so must pronounce it either wholly natural or wholly supernatural.

The two stand-points are not unlike those of the disciple at Bethany and the citizen in Jerusalem, when Jesus sent from the one to the other his message for a guest-chamber. The disciple from his post of observation in the village could see only a train of miraculous events; two heaven-sent apostles, eluding priests and rulers, lost in a crowded city, met by an unknown and unknowing guide, following him into the secret chamber of the holy supper—all as supernatural as if they were convoyed by armed angels to a celestial mansion radiant with godhead. But the householder from his point of observation in the city, might see merely a

medley of trivial incidents; perhaps his casual order for a drink from the fountain; his slave sauntering forth among the festival throngs; the pitcher brought back to his lips, and as he drinks two travellers entering with a business order for passover lodgings—all so natural as to be quite commonplace and forgotten the next moment. And yet this whole complex web of occurrences, in both village and city, whether treated as accidental or as miraculous, has issued in nothing less than the gospel and the church throughout all ages. So is it still with our naturalistic and supernaturalistic critics of all revealed facts and doctrines. Their judgment depends upon the premises assumed and the point of view which is taken, whether it be religious or scientific.

In the view of religion the whole course of revelation throughout history will appear supernatural and miraculous. The original creation itself will seem to have been a stupendous miracle, or series of miracles, producing sky and sea and land, plant and beast and man by six rapid fiats. The career of the chosen people will be one dazzling train of prodigies, from Egypt to Sinai, and from Sinai to Zion. Priests and prophets, with angels and visions, will unfold the marvels of a pure theocracy. Contemporaneous mythologies meanwhile will be only its distorted reflections or satanic counterfeits. As the climax of the whole wonderful theophany, at length God will appear in human form, and Christ and his apostles work miracles of love and power. Nor will the supernatural halo then quite fade away. The Christian church will henceforth march through the centuries, radiant with the Holy Ghost, led by saints and martyrs and attended with angels and archangels and the whole company of heaven. Even now the miraculous glory still lingers in chosen souls. For them nature is but divine art, glowing with divine thought. Providence is only a plastic system of divine volitions ever shifting in unison with their prayers. Consciousness itself involves a hidden sense of Godhead. In the end, for the religionist, all that is natural thus becomes transformed into the supernatural.

In the view of science, however, the whole course of revelation may be claimed as natural and regular. The genesis

of the universe may be shown to have been effected by a slow evolution, through long eras of matter, force, life and mind, without pause or break, until the present day. Any miraculous interruptions of this fixed order of nature, such as are recorded in the annals of all young peoples, when thoroughly sifted, may be found by historic science, to have been mere sacred myths or pious legends, whether attributed to Jupiter or Jevohah, to Solon or Moses, to Hercules or Samson, to Socrates or Jesus. The divine incarnation may simply have repeated the mystery of every human birth. Even the signs and wonders of the Christian epoch may be viewed as intrinsically no more marvellous than those of our scientific era, such as the iron steamer speeding through winds and waves, or the telegraphic wire flashing thought from continent to continent. If it should yet be proved that the Christian miracles proceeded from some occult knowledge of natural laws or were themselves only remarkable coincidences, occurrences or processes, such as a conjunction of planets into one new apparent star at the Epiphany, their apologetic and didactic value would not be impaired. Nor could any genuine fact or truth be lost, though the Scriptures were simply classed as the highest works of devout genius, and Jesus should be loyally worshipped as not less human than divine. In a word, by the scientist everything supernatural is thus reduced to the natural.

But in the view of philosophy, as embracing both science and religion, the very distinction between the natural and the supernatural vanishes, and it becomes unimportant whether a revelation is either or both, so long as it is in effect a transcendental communication from the divine intellect to the human intellect, conveying knowledge not otherwise attained or attainable. It was a maxim of St. Augustine that miracles are not contradictory to nature, but only to our knowledge of nature. Bishop Butler also has shown that the words *miracle* and *accident* simply express our ignorance of general laws, and has declared it a mere verbal question of no moment, whether the scheme of Christianity be considered as miraculous or not, since if it were miraculous its whole development may have been as much regulated by laws as the visible

known course of nature, and might now so appear to all higher intelligences. Nor would it be any less divine should it ever so appear to our advanced intelligence. Though its entire history had been found to be as normal as the growth of a flower, science would still be confronted with the same marvellous phenomena, religion would still retain the same essential facts and truths, and philosophy could still claim the same stores of metaphysical knowledge. We would still have in substance a divine revelation, even if it were strictly natural or connatural in form. This, at least, is all that need here be maintained; and in proof of it several considerations may now be brought forward.

In the first place, there is no presumption against a divine revelation simply as transcendental to human reason. Theism being granted, revealed knowledge would be no more improbable than rational knowledge. Before experience it would seem even less likely that the remote physical realms of space and time should be disclosed by science than that the nearer metaphysical realms of thought and being should be unveiled by revelation. Nor would the mere didactic process of communicating knowledge through an angel or a prophet be any more hostile to our intelligence than ordinary instruction by a teacher or a sage. The untaught savage might find our scientific literature even more incredible than the Holy Scriptures. If it be objected that instruction in the one case is natural, but in the other miraculous, it may be replied: First, that the very word miraculous has been found vague and misleading, and the thing itself a variable and vanishing element. Second, that at the time of creation a revelation could not be miraculous in any sense, and since creation it would be only more marvellous than creation itself, either viewed as an act or as a process. Third, that a primitive revelation, whether miraculous or not, is a known historic event, like other events, susceptible of historic proof. Fourth, that before proof some human events would seem almost as marvellous, such as the story of Cæsar or Napoleon, and others even more marvellous, such as the wonders of modern science. Fifth, that in distinction from all human events there are intellectual, moral, and religious reasons for the divine

event of a revelation, however marvellous or miraculous it might be, though the rent veil were brilliant with broken laws.

In the second place, there is in human reason the intellectual need of a divine revelation. Of the strictly moral or religious need of such a revelation, we do not here speak, having already considered it in the first volume. Recalling so much of the argument as bears upon the present question, we now affirm that the intellect itself, by reason of its limitations and aspirations, both requires and craves some transcendental communication of knowledge. This may be proved: First, by the nature of those metaphysical problems with which reason must deal, but which mere human reason alone cannot solve, such as the origin and object of the universe, the relations and destiny of man, the mysteries of absolute being. Second, by the history of all purely rational philosophy which, whenever it has been without a revelation, has groped in intellectual darkness, and whenever it has cast off such guidance, has but stumbled in moral blindness. Third, by the unquenchable yearning after a revelation which has ever pervaded the philosophic mind like a prophetic instinct that is to be fulfilled.

In the third place, there is in human reason the capacity for a divine revelation. The intellect in seeking it seeks nothing vague and foreign to itself, but only its legitimate sequel and complement. This may be proved: First, by the adaptation of the finite mind to an Infinite Mind, and its susceptibility to education through an objective revelation distinct from that made in nature and in history. Second, by the universal reminiscence or presentiment of a revelation which is expressed in all heathen philosophy. Third, by the germs or rudiments of such a revelation in which all rational philosophy abounds, both in heathen and in Christian schools of wisdom.

In the fourth place, that divine revelation, which purports to have been given, meets both the necessity and the capacity of human reason. As a mere philosophic ideal, whether true or not, it is both desirable and suitable. This may be shown: First, from its form, which, having been progressive, scriptural and marvellous, is adapted to the rational constitution of

mankind. Second, from its contents, which not only elucidate and confirm much that is ascertainable in rational philosophy, but consistently therewith contribute complementary truths and doctrines needed for the consummation of philosophy. Third, from its effects, which have ever been to correct, stimulate and mature all rational philosophy. Fourth, from its evidences, external as well as internal, which at the bar of philosophy itself, for thousands of years, have been mounting with cumulative probability toward moral certainty.

In a word, the true philosophical theory of knowledge must comprehend divine revelation as complemental to human reason in each science and throughout the series of sciences, whether the mere form of that revelation be considered as natural or supernatural.

Rationalism and Superrationalism.

As we pass from the form to the content of revelation, from its external to its internal evidences, we meet two rival schools or factions which may be termed Rationalists and Super-rationalists. According to the latter, the contents of revelation are wholly above reason, and cannot be tested by its methods. This theory grew up as a doctrine in the church until it became identified with orthodoxy. The Old Testament Scriptures from the first were accepted as inspired and infallible, not only by the Jews but by Christ and the Apostles, with their disciples. The early church fathers held that the inspired authors had been as passive, if not unconscious as an Æolian lyre; that Providence preserved even the Greek Septuagint miraculously from error; that its grammatical faults only allowed greater scope for interpretation. The later fathers gradually attributed the same divine authority to the New Testament Scriptures; dwelt upon their harmony with the Old Testament; distinguished them as canonical from the spurious gospels and epistles of heretics; maintained that they could contain nothing superfluous or erroneous, but might involve a three-fold or four-fold sense within their grammatical meaning; and taught that they were to be confirmed and enlarged by an apostolic tradition from the same primitive sources of their own inspiration. The

scholastic divines, while still holding Scripture to be supremely infallible, and infusing into it a seven-fold, eight-fold, even an infinite sense, gradually overshadowed it with the authority of tradition, both apostolical and ecclesiastical, the former derived from inspired apostles, the latter from inspired councils of the church, and serving to define and enforce the only true doctrinal content of Scripture itself. The reformers, assailing this whole dogmatic superstructure as so much wood, hay and stubble built upon the divine Word, proceeded to erect upon it other systems held to be more in accordance with its teaching. And thenceforward, under the influences born of the Reformation, the tendency to superrationalism has been passing through various phases, more or less philosophical, down to the present day.

The first phase has been the theory of an infallible Bible. In distinction from rationalism as well as traditionalism, Protestant divines were led to emphasize a doctrine of plenary inspiration extending to the very words as well as ideas of Holy Writ. Early Lutheran theologians, such as Gerhard, Quenstedt, Hollazius, held that the sacred writers were amanuenses of God, hands of Christ, secretaries of the Holy Spirit; that not merely the sense of the words but the words themselves, every phrase and expression, was individually inspired and dictated; and that neither the Hebrew nor the Greek original could contain grammatical mistakes, barbarisms of style, much less geographical, historical, or numerical errors not chargeable to copyists. Reformed theologians, such as Calvin, Turrettin, Voëtius, maintained that the sacred writers were so inspired both as to words and matter, in mind and memory, as to be preserved from all error; that the Holy Spirit was pleased to employ a rude or elegant style according to their circumstances as well as idiosyncrasies, and may still bring to their readers direct testimony with infallible faith; and the Helvetic Formula decreed the pointed Hebrew text to be inspired both as respects consonants and as respects vowels, either the points themselves or at least the force of the points. The Westminster divines, while discarding both the English and Latin versions as inspired, admitted their sufficiency to the unlearned, and allowed certain literary proofs of inspira-

tion only to insist that full belief in it must be a gift of the Holy Spirit as by a fresh illumination. And such opinions ever since have prevailed among orthodox theologians. The evangelical Gaussen, of Geneva, in his "Theopneustia" declares that we may dispense with the thoughts of inspired writers, but not the words, without which the thoughts might be no better than the fancies of an idiot. Dr. Bannerman, of Edinburgh, in his work on "The Divine Authority and Infallible Truth of the Scriptures," maintains that their whole contents are revealed, as well as inspired, even such truths and events as were already known to the sacred penmen. The Wesleyan Professor Olver stakes the very truth of Christianity upon the tenet. Congregational divines, such as Emmons, Leonard Woods, Eleazer Lord might be cited to the same effect. Prof. A. H. Strong, of the Rochester Seminary, in his Systematic Theology, maintains that inspiration is supernatural and plenary, securing the canon, text and sense of Scripture against corruption, misquotation, false authorship, or any errors in science, history and reasoning. Dr. Basil Manly of the Baptist Theological Seminary at Louisville, in his able work on "The Bible Doctrine of Inspiration," has argued that it logically involves the absolute infallibility of the Scriptures and of their authors for all the purposes of a revelation. And Dr. Robert Watts, of Belfast, has written a treatise maintaining the seventeenth century theory of inspiration to be the doctrine of the chief Presbyterian authority, Charles Hodge; whilst Doctors Archibald Hodge, Warfield, and Patton have ably defended it against the later criticism, as required alike by the Scriptures and the Westminster standards.

The next phase of super-rationalism has been the theory of an infallible Church. In opposition to mysticism as well as rationalism, both Protestants and Catholics have found it logical to assert an inerrable canon, text, and interpretation, such as only historic Christianity could afford. Long before the Reformation, the Roman Catholic Church had claimed such infallibility as residing in the hierarchy, and expressed through the decrees of the General Councils and Pontiffs, whenever voiced with unanimity. From the beginning the Lutheran

Church, whilst emphasizing the canonical Scriptures, had authorized the three œcumenical creeds as largely expressing their dogmatic contents. The Anglican Church, besides interpreting them through the creeds, claimed the right to define their ritual teachings under civil penalties within the pale of a national Christianity. Even the Scottish Church, though rejecting the later creeds, had exalted the Westminster Confession with theocratic claims amounting practically to infallibility. And such forms of ecclesiastical superrationalism in later times have only proceeded towards their logical issue. The most extreme Protestants, by assumptions of a divine illumination and guidance of their respective denominations, have sometimes seemed to take a first step towards infallible councils and creeds; whilst more Catholic divines have not scrupled to admit the historic Church to have been at least the Providential agent in collecting the sacred canon, ascertaining the pure text, and systematizing the essential faith. Milner's "End of Controversy" was designed to prove axiomatically that Catholic Tradition alone affords an infallible interpretation of Scripture. Dr. Martensen in his "Christian Dogmatic" has claimed that the Lutheran Church still adheres to ecclesiastical tradition as expressed in the canon and the œcumenical creeds. Dr. Warrington, of the Anglican Church, has maintained that the divine element in the Scriptures cannot be ascertained *a priori*, but by the traditional testimony of the church, as well as by their internal claims and characters. Bishop Wordsworth expressly bases the inspiration of Holy Scripture upon the external evidence afforded by the infallible Church, with the warning that by appealing from the latter to the former we are in danger of losing both. Cardinal Newman before his conversion, in some lectures on "Scripture and Creed," ingeniously argued that as great internal and external difficulties lie against the former as the latter, leaving the objector to choose between latitudinarianism and Romanism. Dr. Pusey, in his Eirenicon, accepted the Tridentine definition of infallibility with its three criteria of universality, continuance and consent, but maintained that it is now dormant, only residing in the united church of the Greek,

Latin and Anglican communions, as restored to primitive apostolic unity. On the same grounds the high Anglican party in the Protestant Episcopal Church, are offering the four terms of church unity, the Scriptures, Creeds, Sacraments, and Episcopate, in a sense and with claims that seem tending toward infallibilism.

The final phase of super-rationalism has been the theory of an infallible Pope. In opposition to Gallicanism as well as Protestantism, Roman Catholics have reached logically the doctrine, that a true vicar of Christ and successor of St. Peter must be accepted as the unerring exponent of Scripture and Tradition no less than the mere chief of the hierarchy. The growth of the dogma may be traced far back in church history. Möhler, consistently with his theory of development, maintains that its germs were long dormant, until the growing claims of the Roman bishops unfolded it; but De Maistre, in his treatise on the Pope, holds that the doctrine itself existed from the first in the Scriptures, and that the original claims of St. Peter have only been practically fulfilled in the power of the Roman episcopate. Bellarmin evidently so understood it at the Council of Trent, when he maintained that the Supreme Pontiff is absolutely above the universal Church and the General Council, incapable of erring in decrees of faith or precepts of morals, and in doubtful matters binding the whole Church to believe that to be good which he prescribes, and that to be evil which he prohibits. After the lapse of three centuries the last Vatican Council at length declared the Roman Pontiff to be possessed of that infallibility with which the Divine Redeemer willed that His Church should be endowed for defining doctrine regarding faith or morals; such definitions by the Roman Pontiff being irreformable of themselves, and not from the consent of the church. Cardinal Manning, in explaining the scope of this infallibility, has held that it includes not merely truths of natural science and philosophy, but questions of human history; for example, that St. Peter was Bishop of Rome, and Pius IX. his legitimate successor; and consequently that it excludes all historical objections against the dogma itself, and dispenses with the necessity for their detailed refutation

by investigation and argument. Cardinal Newman has offered the absolute need of such infallibility as the strongest argument for the fact of its supply. As if to illustrate the doctrine practically, the Spanish Professor Balmes, at the close of his eloquent History of Civilization, has declared that if the Holy Father should pronounce any portion of it erroneous, he would hasten to recant it. And Fathers Kleutgen and Ward have devoutly averred that belief in it, so far from involving mere human reasoning, is a supernatural work of grace. In the last resort super-rationalism would simply suppress the use of reason.

According to the school of rationalists, however, the whole content of revelation must be tested by reason alone. The growth of the tendency was due to an abuse of the great Protestant right of private judgment. Having rejected the authority of the Pope and of the Church in interpreting the Bible, the emancipated intellect could then proceed to reject the authority of the Bible itself. There was no longer any external restraint upon its errors and excesses. Even the early mysticism, though claiming divine guidance, sometimes betrayed a rationalistic tone and purport by its depreciation of the inspired Word. Sebastian Frank declared that the devil himself might be as well versed in Scripture as sects who adhere to the mere letter; Boehme held that the external letter is a mere guide to a fuller revelation by the Spirit; and Weigel insisted that the claims of the sacred writers to infallible inspiration should be tested and proved as Paul commanded that the spirits should be tried by the brethren. Arminians, like Becker, held that sound reason must precede Scripture, and exists along with it, speaking of things concerning which it is silent. At the same time the early rationalism, whilst freely criticising the sacred writings, sometimes appeared strangely orthodox and devout in its aim and spirit. Using all the appliances of biblical learning, it seemed at first to be only concerned for the genuineness of the canon, the authenticity of the books, the honesty of the writers, the consistency of the narrative, and the reasonableness of the doctrine. In a word, it still claimed to be identical with revealed religion. But by degrees, with the growth of sacred

criticism and the rise of a sceptical philosophy, it gradually broke away from the restraints of pietism and orthodoxy, and entered into open alliances with naturalism and infidelity.

The first stage of rationalism may be described as critical, undermining the canon and text of the Bible. The traditional decisions of the church distinguishing the Old Testament from the Apocrypha, and the New Testament from the pseudo-Gospels and Epistles, were to be reconsidered, and the ancient versions and manuscripts, no autographs or original copies being extant, were to be investigated anew in the light of modern scholarship. Hitherto, biblical criticism, both orthodox and infidel, had lacked scientific appliances. Luther himself had rejected the Epistle of St. James as a mere epistle of straw, chiefly on internal evidence of a dogmatic nature. In like manner, Hobbes, from deistical prepossessions, had denied that Moses was the author of the Pentateuch, as the English deists generally accepted or rejected books or portions of the sacred volume. Spinoza, with more critical knowledge, had assailed the entire Old Testament canon as a mere human compilation of Jewish antiquities, inconsistent with his pantheistic views of miracle and inspiration. Father Simon, the forerunner of modern criticism, then incurred the censure of the Gallican Church by announcing certain editorial emendations in the original documents of the Pentateuch, though he held that they had been made by an inspired hand, and urged that they should be frankly accepted, in order to meet the objections of such learned critics as Spinoza. The great German philologist Ernesti, whilst maintaining orthodox views of the canon against the English deists, exposed its weak points, and disparaged the Old Testament as obsolete, and the Apocalypse as unintelligible. His bolder successor, Semler, the father of German rationalism, in his "Free Discussions on the Canon," proposed to judge the sacred books in the light of their external history, and in accordance with an internal conviction which he called the testimony of the Holy Spirit; and by the application of these principles he discarded the Book of Ruth, Ezra, Esther, the Chronicles, Song of Solomon; threw doubts upon the Books of Samuel, Joshua, Judges, Kings, and classed the five books of Moses

as anonymous fragments compiled by Ezra. By similar methods the learned Michaelis, in his "Introduction to the New Testament," rejected the Gospels of Mark and Luke as historically erroneous, while retaining those of Matthew and John. The destructive criticism was pursued by his disciple Eichhorn, who, in his "Introduction to the New Testament," advanced the hypothesis of a primitive gospel, of which our extant gospels are but erroneous copies, and thus opened the way to speculations which tended to undermine the whole New Testament canon. Eichhorn also, with De Wette, held that the original text of the Scriptures had suffered intentional as well as accidental corruptions in the lapse of time and by changes of opinion, and with Michaelis broached theories of the Pentateuch since pursued by Colenzo and Kuenen. But as yet the rationalistic criticism, though invading the whole province known as biblical introduction, had not passed beyond the pale of nominal orthodoxy.

The next stage of rationalism may be termed exegetical, involving the interpretation of the Bible. In distinction from the Protestant mysticism, as well as the Catholic traditionalism, which had governed the methods of interpretation, it proposed to ascertain the grammatic sense of the original Hebrew and Greek by unprejudiced study, with the aids of philology, in the light of the whole contemporaneous history. The founder of the rationalistic exegesis, Ernesti, in his "Institutes of Interpretation," announced the same hermeneutical rules as applicable to the sacred books which he applied to the classical writings, and by which he had won for himself the title of the German Cicero. The inspired writers were consequently charged with all the errors of their times in geography, history, the natural sciences, and even in ethics and religion; and to vindicate their integrity in consistency with their inspiration became henceforth the chief problem of the rationalistic interpreters. Semler, in his "Apparatus of Liberal Interpretation," devised the famous theory of accommodation, according to which Christ and his apostles are supposed to have adapted their religious teachings to the prejudices and superstitions of their contemporaries concerning angels, demons, the Mosaic system, the

Messiah, and the judgment. Eichhorn vindicated Moses and the prophets for their supposed connivance at popular fallacies. Paulus, in his "Life of Christ," professed to conserve the pure historical element by ingenious and far-fetched explanations of miracles as merely extraordinary events or even natural occurrences which had been artlessly exaggerated by the populace, or overstated by the sacred writers. At the same time the poetical, allegorical, and mythological exegetes were protecting the Scriptures from imagined absurdity and inconsistency by the methods employed in explaining the Greek classics and the fables of Homer and Ovid. Herder, with all his splendid genius, discoursed upon the "Spirit of Hebrew Poesy" in the devotional Psalter as well as in the oriental love-songs of the Canticles; and Eichhorn and De Wette expounded the allegories of Eden and the fall of man. Laurentz Bauer, in his "Hebraic Mythology," treated of the cosmogonic legends of Genesis as a literary phenomenon common to all antiquity, sacred and profane. Gradually the mythic element was admitted into the entire Old Testament in order to enhance the dignity and value of the New Testament. In like manner, by successive concessions, the Gospels were claimed as largely mythical by Gabler and Sieffert; at first only the birth and childhood of Jesus, but at length the miracles of his public ministry, resurrection and ascension. The historical Christ, with his discourses, alone remained, but without supernatural halo or divine authority. The rationalistic exegesis had become thoroughly naturalistic, whilst still adhering to the essential ethics and religion of Scripture, and claiming a place within the limits of nominal Christianity.

The last stage of rationalism may be characterized as dogmatic or philosophical, transforming the distinctive doctrines of the Bible. Having resolved its miracles into myths, and exposed its natural science as obsolete, it had still to explain its ethical and religious teachings in consistency with the inspiration or integrity of its authors as well as with the requirements of modern thought and belief. The English deists had met this problem directly by rejecting the Scriptures as fabulous, or accepting them only so far as they agreed with natural religion. The early German rationalists also

had sometimes imported a masked deism into their exegesis. Lessing, as the literary executor of Reimarus, had represented all revealed religion as purely natural, and as belonging to an infantile stage in the education of the human race. Michaelis, Eichhorn and Paulus had found little more than an ethical theism in the Scriptures. In course of time the deistical or Socinian rationalism found its popular apologist in Röhr, who depicted Jesus as a mere hero of humanity; and its dogmatician in Wegscheider, who discarded supernatural Christianity altogether, and retained only the theism and ethics of Christ as a religion of pure reason.

Meanwhile, however, philosophy had been coming to the aid of rationalism in its warfare with the antiquated orthodoxy and vulgar deism which still impeded its full manifestation. Wolff had taught that revelation must contain nothing self-contradictory, nothing opposed to reason and experience, nothing contrary to the laws of nature and of mind, nothing incompatible with the divine perfections. Kant, within the bounds of the pure reason, had undermined the theistic arguments which support revealed religion. Fichte had defined the pure reason as a critic of the whole content of revelation. Schelling, in his philosophy of mythology and revelation, had made the former a necessary transition to the latter. Hegel, in his philosophy of religion, had claimed Christianity itself as but the highest self-revelation of the Universal Reason. In accordance with such systems theology became filled with various forms of speculative rationalism. Ludwig Nitszch, as a disciple of Kant, maintained that the function of revelation was purely didactic, serving to develop the germs and inculcate the principles of rational religion. Krug, from the chair of Kant and with the countenance of Schelling, argued that revealed religion had been necessarily imperfect and becomes perfectible only through the historical growth and maturity of reason. Von Ammon, uniting the Kantian rationalism with high Arianism, reduced all revelation to mere religious inspiration, dwelt upon the human development of Jesus in distinction from his divinity and advocated the gradual growth of revealed doctrine towards a perfected universal religion. At length the philosophical rationalism

came to a crisis, when the extreme left wing of the Hegelians as led by Strauss effected an alliance with the naturalistic exegesis and exhibited Christian miracles and doctrines as mere pious legends and myths, all useful enough in the pulpit and the cottage, but serving only to mask an esoteric pantheism for thinkers and scholars. From the same philosophical premises and with the same destructive criticism, Christian Baur, the chief of the Tübingen School, in his "Christianity of the First Three Centuries" represented the Gospels and Epistles as products of certain dogmatic tendencies in the early church, the Jewish and Gentile, or Petrine and Pauline types of Christian doctrine. In his later works Strauss incorporated the speculations of Baur with his own theory; represented the Christian myths as largely pious frauds or theological make-shifts; advanced from the creed of pantheism to that of an impersonal monism, without God or immortality; and having thus passed within the camp of infidels and atheists, then raised the pertinent query, Can we any longer be called Christians? At its goal, rationalism thus wholly supersedes revelation.

Between such extremes of Rationalism and Super-rationalism may be found various degrees of reactionary opinion and modified belief. Papal infallibilism has encountered protestantism within as well as without the Roman Church. The Greek Church has never allowed the claim. The Anglican Church has long ago repudiated it. The Gallican Church resisted it with the four famous propositions of Bossuet: that the decrees of the Pope are limited to matters spiritual; that they are subject to the General Council; that they cannot traverse the canons of national churches; and that they must be ratified by universal consent. It is still resisted by the Old Catholics as led by Dr. Döllinger, Bishop Reinkens and Pére Hyacinthe. The claim itself is often so minimized by its apologists as to lose absurdity even in the view of Protestants. Learned Catholics, like Cardinal Gibbons, have explained that it does not extend indiscriminately to all questions in science, art, literature, politics, but simply to matters of faith and morals, already largely defined by the General Councils; that it includes only decisions made *ex*

cathedra with the advice of the Cardinals as in a last court of appeal; and that otherwise it does not secure the Pope against personal error nor exempt him from the duty of confession. Even a philosophical basis has been sought for it by Cardinal Newman, according to whose "Grammar of Assent" belief in it is referred to a sort of implicit ratiocination or illative sense, like good judgment in conduct or taste in art.

Ecclesiastical infallibilism has also met with dissent in historic churches as well as in recent sects. According to liberal and evangelical churchmen, like Maurice, Arnold, and Stanley, it resides neither in the popes alone, nor in the councils alone, nor even in the hierarchy, but in the entire Catholic Church diffusively, as more or less fully expressed under divine guidance through its authorities and representatives. Dr. George Salmon, of Dublin, in his recent treatise, has boldly vindicated such infallibility against the scandals of councils and the blunders of popes, not excepting those of the last Vatican conclave. Its very products, the canon, the creeds, the church dogmas, are explained by theories which lean toward the Protestant doctrine of a subjective illumination or common Christian consciousness in the church. Catholic scholars, like Möhler, Staudenmeier, and especially Newman, in his "Essay on the Development of Christian Doctrine," have represented the whole dogmatic system with its crowning dogma of papal infallibility as an outgrowth of latent germs in Scripture unfolded by the illuminated mind of the church with the authoritative sanctions of its councils and pontiffs, acting under divine guidance. Learned Protestant divines, like Hodge, Nevin and Schaff, have approached the same position by attributing the promised freedom from all error to the invisible church of true believers, as guided by the Holy Spirit, in collecting the canon, formulating the creeds and historically unfolding the orthodox system of doctrine. In fact, both Protestant and Catholic divines seem meeting in the Scripture doctrine of an inerrant church, both visible and invisible.

At length even biblical infallibilism has been modified by a higher criticism claiming to be orthodox rather than scep-

tical. Since Luther rejected the Epistle of St. James, and found blemishes in the prophets, devout exegetes in Germany have been making one seeming concession after another, until the evangelical Kahnis can now affirm that the old theory of inspiration has scarcely a representative left. Philosophical divines, like Schleiermacher, Nitzsch, Marheinecke, Rothe, have defined the inspiration of the sacred writers as differing in degree rather than in kind from that of all true believers. Critical exegetes, such as Neander, Tholuck, Ullmann, Lange, have admitted that the infallibility of the Scriptures is partial rather than total, extending to essential doctrines, but not to matters of history or geography or science. Weiss has blended traditionalism with rationalism in the theory that the brotherhood or pre-canonical church preserved by oral tradition the biography of Christ substantially as recorded by the evangelists, but not without possible errors. The learned Ewald, whilst maintaining the unity, value and divine origin of revelation in both Testaments, ignores the received authorships of the Pentateuch and Prophets, and magnifies the humanistic and naturalistic factors in the development of the sacred canon. Indeed, the history of German exegesis is but a history of departures towards deism, pantheism and infidelity.

Among English divines may be traced similar departures from the early Protestant and Puritan theory of inspiration, in such writers as Warburton, Lowth, Doddridge, Hooker, Arnold, Alford. Coleridge, in his posthumous "Confessions of an Inquiring Spirit," repudiated the notion that the sacred writers were mere intellectual automata in the process of inspiration. Morell, in his "Philosophy of Religion," has likened inspiration to devout genius or exalted religious intelligence. Archdeacon Lee, in his masterly treatise on the "Inspiration of Holy Scripture," has vindicated the dynamic against the mechanical theory; defended the co-existence of human and divine elements in the Scriptures; distinguished revelation as the objective communication of new truth, from inspiration as the subjective process of its reception; traced the several degrees or kinds of inspiration; and maintained that belief in the inerrable Word is a rational result as well

as supernatural grace of the Spirit. Dr. W. E. Atwell, in his work on "The Pauline Theory of Inspiration," likewise distinguishes inspiration from revelation, and holds that the former consists simply in preparing and qualifying the sacred writer to receive the truth as externally revealed. Prebendary Row, in his treatise on "The Nature and Extent of Inspiration," avers that the sacred writers themselves disclaim inspiration and misquote the Old Testament, and argues that the old verbal theory is rationalistic, exposing Christianity to sceptical objections. Mr. Frederick Myers, in his "Catholic Thoughts on the Bible," whilst claiming it to be substantially divine and incomparably superior to all heathen scriptures, admits that it contains unimportant errors, and is of indefinite authority as an external standard of infallibility. Dr. Robson, in his work on Inspiration, has shown that the Mohammedan and Brahminical doctrine makes inspiration act independently of human personality and history, whereas the Bible is a special revelation in consensus with other revealed religions. The learned biblical critic, Dr. Robertson Smith, in his work on "The Old Testament in the Jewish Church," whilst holding that belief in the inspired Word of God is due to the internal testimony of the Holy Spirit, has found the Hebrew tradition respecting the canon and text even less trustworthy than the Christian, has denied that Moses was the author of the Pentateuch, and maintained that the sacrificial system is of later origin. After conducting a "Clerical Symposium" concerning the limits of inspiration, Archdeacon Farrar concludes that all denominations agree in maintaining the majestic superiority of the Bible in all literature, though Rabbi Abrahams ranks Hebrew tradition with the Hebrew Scriptures; though the Roman Catholic Bishop Weathers concedes a rustic simplicity of style in Amos, and finds inspired authority for the Apocrypha; though the Anglican Prof. Leathes deprecates the superstitious use of Scripture language and admits that the Bible is of unequal value in its parts; though the Presbyterian Principal Cairns denies that we have an inerrable canon and text, or that the Bible is divine rather than human in form as well as matter; though the Independent Rev. Edward White terms the notion of a

homogeneous infallibility of the whole Bible a pernicious delusion, leading to the justification by proof-texts of all manner of God-dishonoring doctrines, sacerdotal puerilities, and actual iniquities.

American divines and thinkers, if less pronounced on the question, have begun to utter somewhat similar voices from orthodox chairs and pulpits. Doctors Charles and Archibald Hodge, whilst adhering to the traditional verbal theory, lay more emphasis upon the human elements in the biblical organism, likening inspiration to the hand of the pilot in steering his vessel or the touch of the charioteer upon the reins of his racing steeds. Dr. Patton, without denying the evidencing power of the Holy Spirit, insists that belief in the infallible Word is not irrational in itself or in its objects. Dr. Talbot W. Chambers, of the Reformed Church, before a recent convention of divines, has maintained that the canon of Scripture is to be ascertained neither by the authority of the church nor by the testimony of the Spirit, but by the evidence of historical tradition. Dr. Shedd, in the "Bibliology" of his system, includes ethics and natural religion as not strictly revealed truths, specially communicated by the Supreme Reason, and maintains that the infallible inspiration did not secure the perfect sanctification or omniscience of the sacred authors, nor even the dictation of words as well as suggestion of thoughts to their minds. Dr. Briggs, who advocates the Higher Criticism without its naturalism, in his "Biblical Study," denies that the inerrancy of the sacred writers is the true Protestant doctrine, and quotes the Presbyterian authority of John Wallis to prove that the mere verbal Scriptures are instrumental not magical, a lanthorn rather than a light. Dr. George F. Ladd dedicates his elaborate "Doctrine of Sacred Scripture" to Christian teachers and thinkers who hold the biblical system of moral and religious truth, but are in doubt as to what they shall conclude concerning the sacred writings in which that system is contained; and in distinction from the post-reformation dogma of inspiration he insists that the biblical religion, in common with all historical religions, involves a divine self-revelation but with a special self-revelation in the scheme of redemption.

Dr. W. W. Olsen, of St. Stephen's College, in his work on "Revelation, Universal and Special," classes Holy Scripture with the sacred books of the Chinese, Indian and Grecian religions, as only superior to them in the evidences and qualities of their own inspiration.

Now it has thus been made evident from the history of even orthodox opinion that neither Rationalism nor Super-rationalism can claim the whole truth or be charged with unmixed error. Experience has shown that neither can do without the other. Take Super-rationalism alone. Try to believe everything. Accept first an infallible Bible, with its prophets and psalmists, evangelists and apostles, all speaking as moved by the Holy Ghost, in the same strain, from age to age. Then add to the infallible Book an infallible Church, with its saints and martyrs, and fathers and doctors and councils, all under divine guidance, unfolding the divine word in the creeds and dogmas of the one catholic faith. At length crown the infallible Church with an infallible Pope sitting in the chair of St. Peter as the Vicar of Christ, and blending the voices of an inspired Scripture and illumined Church, amid the discords of an age of unbelief. After all, you would need a reason for the last as well as the first act of faith, and might end by doubting everything that you had believed.

Or take Rationalism alone. Try to doubt everything. After ignoring popes, prelates and presbyteries, begin at the canon itself, and reject, if you will, book after book, version after version, reading after reading, until your Bible has become to you little more than an Iliad or a Shakespeare. Next pass from the text to its teachings in natural science, and prove, if you can, that its astronomy, geology, anthropology are no better than the physics of the Veda, that its ethics do not surpass the maxims of Confucius, that its saints may not rival Gotama. At last penetrate to its most peculiar doctrines of sin and redemption, and resolve that you will accept nothing which cannot be tested by your reason. Even then you would soon find doctrine leaning back upon doctrine, creed upon canon, canon upon church, and you might end by believing everything that you had doubted.

Hence it is that, in the view of philosophy, the contents of

a revelation may be rational or super-rational, either or both, but cannot be irrational or anti-rational. Though above reason, they are not against reason, and sooner or later may consist with reason. They are credible because reasonable, as well as reasonable because credible. They would not be credible, if unreasonable. Worse even than the sceptical notion of a miracle as contrary to the laws of nature is that of a revelation from the Divine Reason as repugnant to the human reason. Bishop Butler, with his rare philosophic candor, warns us not to villify reason, which is our only faculty for judging anything; defines its province as a judge not merely of the evidence of a revelation, but of its substance, so far as respects immutable morality and natural religion; and even argues that its most distinguishing doctrines are susceptible of analogical proof. At the same time, he almost loses his patience with a mere captious rationalism, as he exclaims in the heat of his great argument: "Let reason be kept to; and if any part of the Scripture account of the redemption of the world can be shown to be really contrary to it, let the Scripture, in the name of God, be given up; but let not such poor creatures as we go on objecting against an infinite scheme, that we do not see the necessity and usefulness of all its parts, and call this reasoning." In practical connections the latter admonition may be the one oftenest needed, but here it will be in place to offer considerations in support of the former principle, recalling some heretofore presented.

In the first place, it is no fair presumption against a divine revelation, that its human organs or agents should be fallible and imperfect, at least outside of their authorized communications. Unless it expressly guaranteed their omniscience and absolute purity, the matters actually revealed might in no way depend upon their personal character, but would be real and true even in spite of that character, should it be rude or depraved. When we behold a Shakespeare or a Bacon abusing splendid talents and stained with gross vices, but nevertheless serving as Providential instruments of communicating immortal truth and world-wide benefit to mankind,—we cannot question the miraculous endowments of a David or a Paul merely because of their personal errors

and frailties. Nor on the other hand can we claim as simple products of genius the dicta of an attested revelation at once supernatural in its evidences and superhuman in its contents. The poet and the sage only voice the human heart and reason, but the prophet and the apostle claim to bring us divine ideas through inspired words. With such an accredited revelation in our hands, to read David as we would read Shakespeare, or Paul as we would Plato, is not merely irreverent, but irrational and unphilosophical. Whilst the frivolous or immoral teachings of weak or wicked teachers, such as Mahomet or Mormon, may convict them of delusion or imposture, the Holy Scriptures are distinguished from all counterfeits by a divine excellence of matter, often heightened through very contrast with the human weakness and sin which accompany them.

In the second place, it is no sound presumption against a divine revelation that it should contain mysteries or paradoxes not solvable by human reason. These may simply preëxist in the very constitution of the universe or inhere in the structure and process of the finite intellect. Revelation does not create them, but only involves and communicates them. Science itself discloses riddles which it cannot explain, and offers the same paradoxes which are charged upon revelation. It has been a slow growth of ages; its most authoritative scriptures abound in obsolete opinions and exploded errors; it claims to assume nothing, yet is based upon unproved assumptions of universal order and uniformity as well as of infallible ratiocination; it boasts of its predictive certitude, but is often surpassed by mere animal instinct and rustic sagacity; and with all its utility it brings us a more exact knowledge of the heavenly bodies than of our own bodies, and will tell us of future eclipses and strange disasters in other worlds, while leaving us in this world ignorant of the state of the weather next week. Nevertheless, in spite of such anomalies, it is almost as rational to accept approved science as it is to accept an attested revelation. If it be objected, that divine revelation ought to be a perfect remedy of human ignorance, it may be replied: 1st. That this is begging the question, since the design of a revelation could only be

learned from the revelation itself; 2d. That it soon reduces itself to the absurdity of asking for omniscience, for the finite to become infinite and men to be as gods; 3d. That reason itself is incompetent to prescribe what and how much knowledge should be revealed; 4th. That there might be good reasons for concealing rather than revealing the very knowledge craved; 5th. That mysteries in a real revelation might prove badges of its divine origin, and paradoxes of reason be found resolvable into higher truths of faith.

In the third place, it is a strong presumption for the reasonableness of a divine revelation that its contents prove to be so largely susceptible of a human demonstration. Notwithstanding its real mysteries or seeming paradoxes, its ethics and natural religion can be maintained, as they have been maintained, on purely rational grounds; and its most distinctive theology, the doctrines of sin and redemption, have been shown to be in strict consistency and analogy with the whole preëxisting constitution of nature and humanity. Even its astronomy, geology and anthropology are found to be metaphysically true, and the reasonable presumption is that when all its contents have been fairly brought within the purview of reason in the progress of science, they will be demonstrated to be in accordance with all other facts and truths otherwise known and proved.

In the fourth place, there is in divine revelation a necessity for such a human demonstration. It is not meant that reason is either prior or superior to revelation, but simply that although inferior and supplementary, it is nevertheless indispensable. This will appear: 1st. From the origin of revelation as a direct emanation from the infinite reason of God; 2d. From the aim of revelation as a direct communication to the finite reason of man; 3d. From the purport of this communication as conveying new truth, which must sooner or later, in greater or less degree, be found rationally consistent with the old.

In the fifth place, there is in divine revelation a fitness for such a human demonstration. On examination it proves to be susceptible of rational investigation and vindication. This appears: 1st. From its actual evidences, which, unlike those

of false revelations, satisfy the demands of reason; 2d. From its actual contents which present new problems upon which reason cannot but be exercised; 3d. From its actual structure which as a mere fragmentary composition of facts, truths and principles devolves upon reason the task of their logical organization into a system.

In the sixth place, such a human demonstration is already in progress. The reconciliation of revealed and rational knowledge is now going forward, wherever the two are thrown into combination. It may be discerned: 1st. In all apologetic, exegetical and systematic theology which are respectively but so many attempts to demonstrate the evidences, import and harmony of revelation; 2d. In all rational philosophy which whenever pursued independently, though reverently, has but served to develop and elucidate problems propounded by revelation; 3d. In all the special sciences which by their own normal procession in human history are but logically unfolding the attributes of the revealed Jehova and the chief articles of revealed religion, in harmony with the facts and theories of physical and psychical science.

It is obvious that such attempts to harmonize rational and revealed knowledge advance upon an assumed correlation of reason and revelation in the process of cognition, as well as upon their historic interaction in the progress of science. This is the remaining problem now to be considered.

Agnosticism and Gnosticism.

As soon as we pass from the form and content of divine revelation to its relations with human science, we meet the rival schools of the Gnostics and Agnostics. According to the latter, science must ignore revelation as involving pure faith or mere conjecture rather than strict knowledge. The tendency has had rapid growth since the Reformation. In becoming independent of the Church and of Theology, Philosophy was left free to pursue its own career by its own methods. At first the ancient philosophies simply re-asserted themselves, and the champions of Plato and Aristotle fought the old battles on new fields and with new weapons. At length Telesius, Patritius, Campanella appeared as the

forerunners of physical science. It was perverted into naturalism by Pomponatius, Bruno and Vanini. The beginnings of scepticism were seen in Montaigne, Charron and Sanchez. By degrees, with the rise of modern philosophy and the growth of religious doubt, the agnostic tendency has emerged into view and passed through various forms or phases more or less philosophical in their nature.

Its first phase was simply deferential toward revealed knowledge. The old theology was still venerated, and even tolerated within the domain of philosophy, but its mixture with science was deprecated as intrusive and corrupting. Bacon declared that to seek divinity in philosophy was to seek the living amongst the dead; that it is founded upon the word of God alone, not upon the light of nature; and that its mysteries must be exempt from the examination of reason. Hobbes often wrote like a theologian, quoted scripture abundantly, and even deferred to its authority so far as enjoined and interpreted by the civil power, but after all, could find no place for even natural theology within his scheme of strict science. Locke, apart from his philosophy of the sensational and finite, not only revered the Christian religion, but vindicated its reasonableness, especially its high ethical teaching, though his principles, as pursued by the French materialists, afterward led to its denial and rejection. The Scottish school of common sense was always favorable to the Christian faith.

The next form of the agnostic tendency was more critical towards revealed knowledge. In common with all other knowledge it became involved in subtle speculations concerning the cognitive faculty and process. Hume, decrying alike the material substances of Locke and the spiritual substances of Berkeley, left science resting upon mere experience and precluded a miraculous revelation as incredible, if not impossible. Kant, following Hume with a fresh criticism, found no basis for theism in the pure reason, supported it only with the practical reason, and held an authoritative revelation to be possible, but valuable merely as confirming his ethical deism. Hamilton, whilst vindicating the Scottish realism against the Kantian idealism, assailed the German notions of the Absolute and Infinite as self-contradictory and unthink-

able, and thus presented revealed realities, God and divine things, as objects of mere faith rather than of pure knowledge. This doctrine of prudent nescience he fortified with testimonies from the schoolmen and divines as well as by philosophical reasonings.

The last form of the agnostic tendency has been sceptical as to revealed knowledge. The attempt has been to distinguish it from rational knowledge as wholly lacking in scientific qualities and to depreciate it as mere sentiment or superstition. Comte, completing the materialistic movement of Locke, simply ignored the whole metaphysical region as unscientific, and rejected theology as an outgrown infantile stage in the development of positive science, but offered only empirical proof of his supposed law of intellectual evolution. Herbert Spencer, however, entered the metaphysical region with the explosive logic of Hamilton, and thereby essayed to prove the Absolute and Infinite Cause of the universe, inconceivable, unknowable, and unrevealable. The views of Comte and Spencer were adopted and modified by Lewes, John Stuart Mill and Fiske. At length Professor Huxley, having reached similar conclusions as a student of Hume and Kant, has invented the term agnostic as suggestively antithetic to the gnostic of church history, who professed to know so much about the very things of which he was ignorant. Were its aim fully accomplished, agnosticism would drive revelation wholly beyond the pale of science.

But, according to the rival school of gnostics, revelation is the complement of science throughout its whole metaphysical region. The tendency, though checked by the Reformation, has kept pace with the course of modern philosophy. At first, during the formative period of the seventeenth century, Aristotle still dominated the Catholic schools, and the Reformers were too much absorbed in reconstructing a purely biblical theology to pursue the ancient speculations, or noticed them only to disparage them, making philosophy ancillary to divinity. There were such exceptions as the two Picos, who sought to recombine Platonism with Christianity, and the German mystics, Paracelsus and Von Helmont, who claimed to unite the Aristotelian physics with revealed religion. To

the same transitional epoch belongs logically, though not chronologically, the later school of Cambridge Platonists, Cudworth, More and Whitechurch, as opposed to the English deists. But on the appearance of the new systems of speculation and with the wonderful growth of the natural sciences, it became an apologetic tactic to capture and hold them as integral parts of a Christian philosophy. And accordingly the old gnostic tendency of the early church has been reasserting itself with increasing vigor.

Its first effort was to base rational with revealed knowledge in theism. In seeking for the metaphysical foundations of cognition it was natural to resort to that one essential Mind who was still revered as the creator and upholder of all other minds. Descartes, as a devout Catholic, not only deferred to revelation, but founded his theory of knowledge upon the divine veracity alone, as producing ideas in the mind concurrently through the senses. Malebranche, applying the principles of Descartes, made all nature an ideal theophany, or divine revelation of ideas to the mind, and thus based even the evidence of an external world upon the Scriptures and the Church. Although such speculations were pushed toward infidel pantheism by Spinoza in Holland, they were driven to the other extreme of Christian theism by Norris and Collier in England, who made all knowledge depend upon God as revealed in Christ. Afterwards Berkeley, in distinction from Malebranche as well as Locke, based our cognition upon its correspondence with an Omnipresent Eternal Mind which knows and comprehends all things and exhibits them to our view in accordance with what we call the laws of nature.

The next effort of the gnostic tendency was to harmonize rational with revealed knowledge. The existing philosophy, whatever it might be and however independent of revelation, was held to be logically consistent with it as a cognate source of truth and doctrine. Leibnitz, in opposition to Bayle, wrote a treatise on the harmony of reason and faith, and Wolff on the basis of the Liebnitzian philosophy, harmonized natural with revealed theology. While some disciples of Kant departed towards rationalism, others, such as Krug, Ammon, Bretschneider, claimed the practical reason as a support of

theism and revelation. Schelling and Hegel themselves included Christianity in their philosophies of religion, and the orthodox wings of their schools sought a philosophic statement and vindication of its most peculiar doctrines in terms of the Infinite and Absolute Reason. Marheinecke found even the trinity in the Hegelian trilogy. Conradi termed God the Father the absolute substance personified. Usteri described the atonement as the reconciliation of the finite with the Infinite. There has been scarcely a phase of German thought which has not been arrayed in a Christian garb and yielded a new dialect for the Christian faith. The learned theologian, Karl Daub, passed through all the successive schools from Kant to Hegel, sincerely endeavoring to adapt orthodox Christianity to each new form of speculation.

The final effort of the gnostic tendency has been to merge all rational in revealed knowledge. Philosophy, having been admitted within the pale of theology, was claimed as its offspring and the sciences treated as mere scintillations of an omniscient revelation. Not only has the biblical theology been offered as a complete theory of the universe, but it has been supposed that inspiration embraced the whole field of scientific inquiry and may even afford a mystical vision of all the realms of nature. Following in the path of Boehme, Swedenborg and Schelling, a train of scripture scientists has been reading each new phase of physical discovery and speculation into the popular and phenomenalistic language of the sacred writers. As we have seen in the chapter on Eclecticism, not merely the established theories but the crudest hypotheses of astronomers, geologists, anthropologists, sociologists, have figured as the Biblical Astronomy, the Scripture Geology, the Sacred Ethnography, the Christian Socialism, and the whole Bible presented as a scientific cyclopedia translated direct from the arcana of Omniscience. In its issue such gnosticism would render all science a mere reflection of revelation.

Instead of being mere vague tendencies, Gnosticism and Agnosticism have at length become the two recognized factors in current philosophy and are found pitted against each other as conscious antagonists in every sphere of civilization. The

opposing lines seem formed as for a last encounter. At the extreme right still stands the Catholic school of mediæval philosophy, with a grand consistency maintaining the absolute supremacy of revelation in an age of unbelief and conceit. Father Harper, with pious elaboration, is recalling to modern appreciation the metaphysics of the angelic St. Thomas. Dr. Albert Stöckl writes the history of modern philosophy to show its futility, and claims that the system of St. Thomas would soon recover its power if duly arrayed in the literary culture and scientific knowledge of our time. Father Kleutgen, in his "Scholastic Philosophy," maintains that there is an inherent religious knowledge different from philosophical knowledge, and claims that the patristic authorities are unanimous in maintaining a certain apprehension of God which is natural to man and divinely infused in the human intellect, even that of the most uncultured persons, all who have not quenched the light of reason, so that men who do not thus cognize God are without excuse. Father Ward, formerly of the Church of England, quotes Cardinal Franzelin and M. Laprune as holding that moral and religious doctrines are not incorporated by human reasoning, but by divine grace in the very substance of personality, as the soul of the soul and life of the life; and he explains that the intellectual faculties are divinely guided into adequate knowledge of the truth by implicit yet real reasoning; that however useful more explicit reasoning may be among scholars and thinkers, the most uneducated Catholics have ready access to its premises, and through prayer may be impressed with these premises in a salutary manner; and therefore that they should not have their implicit faith unsettled by a purely secular or mixed education. The Italian philosophers also hold to a natural cognition of God as the basis of Christian faith and culture.

On the high theistic ground common to Catholicism and Protestantism are the more philosophic defenders of revelation, such as Ulrici, Lotze and the younger Fichte, Ferrier, Flint and Calderwood, Henry B. Smith, Hodge and Diman, together with later recruits who are in conflict with the newest phases of the agnostic tendency as manifested on both

sides of the Atlantic. Principal Caird, in his "Philosophy of Religion," claims that Spencer's relative knowledge and knowledge of the Absolute are irreconcilable; that the only logical conclusion would be the non-existence of the Absolute as a misleading abstraction or fiction; and that the worship of the Absolute as unthinkable and unknowable is a sheer impossibility, since it can become adorable only as the realization of our highest ideal of spiritual excellence. The Rev. J. Iverach, in his work, entitled "Is God Knowable?" argues historically that Christian theism reconciles all that philosophy and science have reached in respect to the ultimate problems of knowledge, and pertinently asks, how can the Unknowable be ever manifesting itself to knowing beings, or the ever revealed be the ever unknown, or the ever evolved be ever hiding himself in his own nature. Dr. Matheson, treating of the query, "Can the Old Faith live with the New?" compares the ancient gnostic with the modern agnostic, insists that it is not transcendental logic nor mystical absorption, but experience which shows us that nature is inadequate to account for her own existence, and claims that there is no barrier to divine knowledge either in the finitude of the subject knowing or in the infinitude of the object known.

English divines are not less pronounced than the Scottish in their gnostic tendency. The Rev. Henry J. Clarke has maintained as a tenet of Fundamental Science the infinite cognoscibility of the Infinite as a potential Will and Mind in nature, capable of self-revelation to man and of incarnation in history. Prebendary Griffith has passed behind the veil of absolute existence to find a Bible metaphysic including the invisible realities of force in nature and personality in man as dependent upon the one Supreme Reality of realities, God. At length the Bishop of Peterborough and Principal Wace have drawn Professor Huxley from his vantage ground of science into the field of biblical criticism to meet the charge of "cowardly agnosticism" and show cause why, as a disbeliever in the Christian evidences, the agnostic should not frankly call himself an infidel.

Among American thinkers Bishop Littlejohn, in his learned

and timely lectures on "The Christian Ministry of the Nineteenth Century," has vindicated the knowableness of the Absolute with the necessity of a revelation, and shown that the New Philosophy of Herbert Spencer inconsistently compels us to ascribe at least six of the divine attributes to the Ultimate Cause, such as being, causality, omnipotence, eternity, wisdom and love; that it absurdly refuses to recognize the character of that Cause in the order, intelligence, beneficence and beauty of the creation; that it vainly asks us to worship that of which we cannot even conceive or be conscious; and that like many systems gone before it, it will have its day and take its place in the great gallery of speculative curiosities. Prof. George S. Morris, in his lectures on "Philosophy and Christianity," maintains that both have a common mission against agnosticism as alike dealing with the Absolute; that the Absolute necessarily becomes known in the cognitive process of a revelation from the divine to the human spirit; and that in the biblical ontology the Absolute is revealed as God, the eternally self-existent Jehovah, the First and the Last, whom the heaven of heavens cannot contain. Prof. Samuel Harris, in his works on the "Philosophic Basis of Theism" and "The Self-Revelation of God," argues that Agnosticism contradicts universal consciousness; that it is self-annulling, involving latent knowledge, since it claims at least to know that we do not know; that a Supreme Reason is necessarily presupposed in all scientific knowledge both of the individual and of the collective intellect; and that it has been self-revealed as Absolute in nature, personal in history and incarnate in Christ. On the same basis of "Scientific Theism," Professor Francis E. Abbot maintains the knowableness of the unknown and the infinite intelligibility of the universe. Prof. Ransom B. Welch, treating of "Faith and Modern Thought," against the knowing nescients vindicates clearly the claims of faith in philosophy. And in a more practical spirit Dr. Noah Porter exposes the atheistic consequences of Agnosticism as a doctrine of despair.

At the agnostic extreme, arrayed against the prophets, apostles, saints, fathers, schoolmen, divines and Christian thinkers of all ages, appear the modern advocates of pure

science as opposed to revealed knowledge and doctrine, Comte, Spencer, Huxley, Tyndall, with their associates and followers in various spheres of thought and research. Dr. Draper writes the "History of the Conflict between Science and Religion," which has become characteristic of the highest speculation and culture of the time. With exhaustive research President Andrew White is tracing the "Warfare of Science" against bigotry and superstition. Professor Max Müller tells us, in his Preface to the "Critique of Pure Reason," that having once learned from Kant what man can and what he cannot know, it has been his plan of life to learn from literature, tradition and language, how man came to believe that he could know so much more than he ever can know in religion and in philosophy. Mr. Richard Hodgson, as a disciple of Spencer, in an essay on the "Consciousness of External Reality," declares that the Unknowable has built up his physical, mental and egoistic microcosms through successive stages without even any intelligible links between them. Mr. John Wilson, of Trinity College, Dublin, in his "Thoughts on Science and Theology," says that if religion means in the theological sense the worship of a man-like ghost, science can have nothing to do with it, but if it means obligation to some Superior Power, it is possible for science to have a religion and an ethic without the supernatural sanctions of anthropomorphic theology. Mr. Raymond S. Perrin has constructed a Religion of Philosophy as issuing from the unification of knowledge, devoid of a personal God or a future life. Professor William Graham, in his "Creed of Science," would substitute for the rhapsodies of supposed revelations the more exact knowledge of one Ultimate Power as infinite and eternal and as manifested in an optimistic universe. Dr. Richard Bithel has also formulated a "Creed of the Modern Agnostic" for both secularists and churchmen, which attributes causality, spontaneity and life to the Unknowable, and which he claims to be consistent with theism, morality and immortality. But in opposition to all such agnostic religions, Mr. Frederick Harrison, as a disciple of Comte, insists that Agnosticism itself is only a stage in the evolution of religion, and that scientists must choose between

belief in nothing at all or belief in the future of civilization, between the worship of the Unknowable and the worship of Humanity. In view of this alternative, Professor Huxley feels obliged to declare that he would as soon think of bowing down before the generalized conception of a wilderness of apes as before the abstraction of Humanity either in the past or the future.

At the same time, between the extreme Gnostics and Agnostics is a somewhat motley group of thinkers in different countries who can be classed with neither school, being largely influenced by both tendencies and seeking to adjust their claims. Such writers earnestly discuss their religious relations and issues. Dr. Martineau, in his "Study of Religion," maintains that agnosticism has been produced by the gnosticism of theologians who speak of the God absolute as unrelated to human intelligence, and therefore not even relatively known, while agnostics make a similar error by insisting that God as an infinite object, in order to be cognizable, must be absolute in the sense of being wholly unrelated to our intelligence. The Rev. M. J. Savage, in one of his discourses, defines agnosticism as despair in regard to the mysteries of the universe; produced by reaction against the over-familiarity of divines with the purposes of the Almighty, by the abuse and decay of the old theistic arguments, by the new scientific view of the creation as practically infinite and unknown, and by the specious use made of the doctrine of relative knowledge. Dr. Josiah Royce, who has ingeniously revived the Berkeleyan theory of a universal external consciousness without its theistical assumptions, advocates in his "Religious Aspect of Philosophy" a favorable hearing of Agnosticism, on the ground that its accepted doubts will be found to involve religious belief bearing upon reality and conduct. Prof. James M. Hodgson, discussing the relations of "Philosophy and Faith," founds a plea for agnostic belief in the incompetency of reason to judge of revealed truths which as objects of religious faith are beyond the boundaries of possible knowledge, though not devoid of reconciliation with scientific facts. Dr. Stuckenburg goes so far as to declare that all Christians are agnostics in reference to scientific

knowledge, and pure science has no concern either with theism or atheism, or if concerned with either, may even be interested that there should not be a God.

In the sphere of agnostic ethics the discussion has become still more impassioned. Professor Momerie, whilst freely criticising the defects of modern Christianity, especially its pulpit caricatures of the Divine nature and attributes, in his discourses on "Agnosticism" insists that if disbelievers in deity and immortality are men of the highest moral tone they have no right logically to be so. Mr. Percy Greg, in his treatise on "Negative Science and Natural Ethics," declares explicitly that the Agnostics have no logical right to their virtues; and Miss Frances P. Cobbe, in her papers on "Magnanimous Atheism" and "Agnostic Morality," represents them as fancying that they might choose between morality with or without religion, and sums up their creed as a believing neither in one God nor in three, and expecting that they that have done evil and they that have done good shall alike go into everlasting nothingness. In reply to such strictures Dr. Bithell, in his "Agnostic Problems," elaborates a full list of the religious and moral sentiments as reconcilable with his agnostic creed. Mr. Balfour, however, has argued that the "Religion of Humanity," whatever may be its ethical pretensions, must prove inferior to Christianity as a moralizing agent.

But it is in the wider realm of philosophy, and along the border lines between the metaphysical and the empirical provinces, that the two parties have become most confused and commingled. As a representative of general scepticism, Mr. Arthur J. Balfour has offered a vigorous "Defence of Philosophical Doubt," in which Science is shown to be without valid basis both as to its empirical and its transcendental elements, and to have become as domineering in its bearing towards philosophy as once was theology. Mr. Malcolm Guthrie has argued that Spencer's "Unification of Knowledge" cannot be based in his agnostic principles, but may only be reached by induction and experience with the increase of the sciences through ages yet unborn. But not a few scientific writers have been looking across their empirical

boundaries into the metaphysical region, as into a promised land of Science. Stanley Jevons, in opposition to the miscalled positive philosophy, has held that true Science will not deny the existence of things because they cannot be weighed and measured, but rather lead us to believe that the possible wonders of existence surpass all that we clearly perceive. Clerk Maxwell, though maintaining that all we can know of the universe is the picture presented to us by consciousness, can still discern in the dim background of that picture an ultimate Creator of matter and force. Sir Edmund Beckett traces the origin of the laws of nature to an eternal, omnipresent, omniscient Power, though he sees no advantage in the personal titles of deity employed by theologians, and prefers the good old intelligible name, the living God. Profs. Stewart and Tait, in their "Unseen Universe," represent the visible world as developed by Unseen Intelligence, from which alone information can come through some trustworthy communication rather than by any mere scientific reasoning. Mr. Shadworth Hodgson, while maintaining this unseen world to be purely phenomenal and a deity wholly noumenal, admits that His personality may be apprehended, at least vaguely, as by an emotional strain, and even confesses that it would seem no honor to God, nor benefit to man, that He should forever withhold Himself from all communication with human reason.

At times the agnostic question has emerged in more practical discussions, not unlike the debate between Prof. Youmans and Mr. Park Godwin concerning the religious limitations of science. The freedom of thought and research, it is often alleged, has been restrained by theological prejudice. It was a saying of Cousin that Italian philosophy is still in the bonds of scholasticism. The English evolutionists encountered more theologians than metaphysicians. Helmholtz attributes a superior success of the German scientists and thinkers to their greater exemption from social and ecclesiastical interference. It seemed a purely philosophical discussion which Du Bois-Reymond occasioned by his treatise on "The Seven Riddles of the World," the transcendental problems of matter, motion, life, design, sensation, thought and will, so long as he

maintained that before them we must confess a hopeless ignorance: *Ignorabimus.* But a different tone was imparted to the controversy when Virchow, at Berlin, took the orthodox view that in regard to such inquiries we should exercise a wholesome restraint: *Restringamur.* In answer to that challenge, Haeckel entered the field with his essay on "Freedom in Science and Teaching," offering to rally the other German universities with the call to undaunted research and progress: *Impavidi progrediamur.*

It must now be evident, from so mixed a state of opinions and parties, that Gnosticism and Agnosticism are both true so far as they limit each other, and only false when driven apart into extremes. Take either by itself and it will become erroneous and pernicious. Trace agnosticism to its issues. Resolve to believe nothing which you cannot know on scientific grounds with scientific evidence. Bring before you the whole imposing structure of physical science and test logically its materials and foundations. You will see, not only that it is largely composed of crude hypothesis and vague conjecture, but that it rests upon an assumed uniformity of nature which has not been demonstrated and is not demonstrable. You will find that it proceeds upon a covert ratiocination which is so vague and baseless that the sceptic can tear it to shreds before your eyes. And you will at length reach its ultimate postulate in a confessed absurdity, a demonstrated contradiction of the Infinite with the Absolute and both with the Finite. In a word, your whole science will collapse in conscious nescience; your reasoning will be the suicide of reason itself; your very knowledge will stultify your faith. You will not even believe what you know.

Then follow out Gnosticism to its conclusions. Endeavor to convert your faith into knowledge and complete your science with revelation. Unfold your theological theory of the origin, development and destiny of man from the apostacy to the judgment, until the whole problem of the earth has been solved: There will still exist countless other worlds of whose history and destiny you cannot yet conjecture. Add science after science, as you press on through the orbs and ages, until the vast involved riddle of creation has been

unravelled; there will still remain the Creator Himself, capable of creation after creation, world without end. Add revelation to revelation; you will still be confronted with the unrevealed and unrevealable godhead. Your science can never overtake Omniscience. Your finite reason can never overmaster the Infinite Reason. Your knowledge can never outrun your faith. You can never fully know all that you believe.

The simple truth then is, that the boundary between knowledge and faith is no mere mathematical line or impassible barrier, but rather an ever-shifting signal which advances before us as we approach it. To definitely ascertain it would be as futile as to chase the rainbow or limit the horizon. The credible becomes cognizable. The discoverable is still complemented by the revealable. The unknown is at once the ever-knowable and the ever-unknowable. According to that maxim of the philosophic St. Clement, faith is abbreviated knowledge, and knowledge enlightened faith. "Know, that you may believe," said Abelard; "Believe, that you may know," said Anselm. Agnosticism without gnosticism leads to scepticism in religion as well as science; Gnosticism without agnosticism tends to mysticism in science as well as religion. Their union issues not less in the perfectibility of science than in the demonstrability of religion. Let us look at some of the proofs of this harmony.

In the first place, there is nothing in the process of rational knowledge which can preclude revealed knowledge. When in contact with a revelation the human intellect is simply recognizing the divine intellect, as mind converses with mind, with only a difference in the mode of converse. Though the one is finite and the other infinite, like concentric circles, they may ever coincide. When the agnostic tells us that our consciousness is finite, he forgets that it is indefinitely expansible towards the infinite, ranging from the narrow horizon of the infant or the savage up to the boundless thought of the philosopher, which embraces the universe itself, or the ecstatic vision of the saint, which includes even the Creator with the whole creation. Not in consciousness itself can he find barriers to a revelation. Nor yet in the region beyond con-

sciousness. When he assumes that an Absolute Mind cannot become known to our minds, he simply assumes to know what he has already ignored as unknowable. On the theistic theory, as heretofore proved, the Absolute Reason through a revelation may come into relation with our reason, and yet still transcend it and ever remain independent of it. At the same time, though we may ever apprehend, we can never comprehend this Absolute Reason; though we may ever pursue the Infinite Intelligence we can never overtake it. The more we know of it, the more will we know it as passing knowledge. To know God is life eternal.

In the second place, there is nothing in the process of revealed knowledge to preclude rational knowledge. Distinct and peculiar as revelation may appear among other divine communications, yet it does not interfere with our cognitive faculties, nor supersede their normal exercise. The gnostic may sometimes represent it as wholly supernatural and superrational, if not irrational and unnatural, and may himself experience in connection with it mystical acts of divine illumination and communion. But there is a sense in which it is also largely natural and rational, in accordance with ordinary forms of intelligence. In one view revelation is a universal phenomenon. The Creator is everywhere a revealer, and the whole creation radiant with His intelligence. The migrating birds are moved by the Holy Ghost no less than the nomadic peoples. The bee is inspired to build his cell as well as the artist to mould the statue or frame the temple. Whether Isaiah or Milton sings, whether Paul or Plato reasons, it is the inspiration of the Almighty which giveth them understanding. Holy Scripture itself is but the crown and complement of the whole theophany of nature, and divine revelation only the last and highest expression of the Absolute Reason.

In the third place, both rational and revealed knowledge have the same logical foundations. The scientific proof of the one is like that of the other. In either case it is based upon the intuition of the individual and the experience of the race. Not merely as subjective and objective factors in consciousness, but as social processes in history, the finite mind and the

infinite mind have been logically interacting for thousands of years until they have developed vast bodies of revealed doctrines on the one side and rational theories on the other, and these have brought with them an ever increasing evidence under the searching tests of successive generations. If it be objected that the evidence of revelation is not demonstrative or conclusive, but probable and cumulative, it may be replied, 1st. That science itself is founded only upon such evidence, as the masters of its logic have already shown. 2d. That besides such evidence, revelation has miraculous, prophetical and historical proofs peculiar to itself and valid by the highest tests. 3d. That the sciences themselves may be included among the evidences of revelation through their growing harmony with it and illustration of its truths and doctrines.

In the fourth place, revealed knowledge proves to be the due complement of rational knowledge, as will hereafter be shown. The Bible is found to embrace the whole metaphysical province of the sciences, disclosing needed realities and truths, otherwise unknowable. We enter them with the light of reason from psychology, grope through their metaphysics or cosmology to find them end in ontology as a realm of twilight and darkness, until it becomes illumined by the light of revelation.

In the fifth place, rational and revealed knowledge advance together toward completion. It will be shown in the closing chapter that the interaction of reason and revelation involves the perpetual expansion of human science towards divine omniscience or the gradual perfection of the sciences in the normal order of their evolution.

SECTION IV.

Complete Theory of the Sciences.

The elements of a complete theory of the sciences are now before us. The three problems which it involves, the problem of knowing, the problem of being, and the problem of revelation, have been fully discussed and their solution

attempted. As to each problem rival schools have been compared, extreme errors avoided, and resultant truths combined. The avoided errors are positivism and absolutism, atheism and pantheism, scepticism and rationalism. The resultant truths are an idealistic realism, a monistic theism, and an agnostic gnosticism. We do cognize things as well as thoughts; we may discern God in the world as well as the world in God; and we can recognize Him as ever revealed yet ever concealed in both Nature and Scripture.

Bringing together these elements, we have the general theory of a perfectible science as distinguished from a conceited nescience and a fancied omniscience. On the one hand it would not dissolve all science in sheer absurdity by undermining the very process of reason; on the other hand it would not evaporate all science in mere speculation by superseding the whole process of revelation. It would neither start with the agnostic from the irrational and antirational, nor end with the gnostic in the unrevealed and unrevealable. It would neither ignore the Absolute as wholly unknowable, nor cognize it as fully knowable, but ever apprehend it, yet never comprehend it. It would neither reject the Infinite as unrevealed, nor claim it as demonstrated, but ever traverse it, yet never transcend it. It would neither assume to know nothing nor presume to know everything, but ever aim to know more and more of the intelligible universe. Through the joint process of reason and revelation, with blending knowledge and faith, it would pursue the ever-unknowable as still the ever-knowable, both here and hereafter, in this world and in all worlds, and so find eternal life in the knowledge of that which passeth knowledge.

Applying this theory to the sciences, as arranged in their normal order, we shall see them assuming a progressive tendency toward perfectible knowledge. Each special science will be found to have its rational and revealed portions, like well-poised wings, supporting and balancing each other, and the whole series will be drawn one after another as they advance together in their progress through the ages. Astronomy, as rational and revealed, will be unfolding the creation and destiny of worlds; geology, the genesis and apoca-

lypse of our earth; anthropology, the apostacy and redemption of mankind; psychology, the regeneration of the soul and resurrection of the body; sociology, the organization of society in the State and its reorganization in the Church; theology, the rise of the ethnic religions and their mergence in the one universal religion. Philosophy itself, as the science of the sciences, in the blended light of reason and revelation, will be ever reviewing, though never overtaking, the track of the Infinite Intelligence and ever recapitulating, though never overmastering, the process of the Absolute Reason.

The Theory of Perfectible Science primarily has its foundation in the nature and the history of the human intellect. As there are no bounds to its curiosity, so none have yet been found to its cognitive capacity. Judged by its past attainments, it may be indefinitely expanded. Before experience it would have seemed improbable that the human infant, differing so little in appearance from the infant chimpanzee, could ever be developed into a Milton or a Newton; and even more improbable, that our savage ancestors in the British islands could surpass the Greeks and Romans in civilization as far as they surpassed the half-animal tribes of pre-historic time. Yet the child of to-day soon knows more than all the sages of antiquity, and modern nations advance farther in a generation than the whole race through previous ages. Hitherto at least, the intellect of man, unfolding with increasing volume and momentum, has given no signs of exhaustion. Nor do even its physical limitations offer insuperable barriers to its progress. Already it has equipped the very brain through which it acts with telescopic and microscopic senses and transformed the earth which is its home with miracles of art and culture. Were it freed from this grosser body and clad in some more ethereal vehicle, it might only gain greater freedom and prowess. It is even conceivable that the planet itself, as it grows from its geogonic through its historic ages, may yet become insphered with emancipated spirits, as far beyond us in physical refinement as we are beyond the coarser organisms of the primeval globe, until at length its spiritual shall have predominated over its material forces. With the round, hard earth thus volatilized and brought into

ethereal relations with other orbs and races, the whole terrestrial intelligence might become allied with angelic thought and seraphic fervor in the universal career for eternal knowledge. Be all that as it may, not even fancy itself can set bounds to the indefinite expansion of the human mind.

The Theory of Perfectible Science also has its foundation in the structure and the development of the intelligible universe. Not only is the cognitive capacity unbounded, but the cognizable material is inexhaustible. The vastness of the known only helps us to conceive of a still vaster unknown, and the one is ever encroaching upon the domain of the other. Science has already unveiled its own field of research as practically infinite and eternal, with no boundaries in space or time. And so infinite a realm of knowledge simply requires an infinite process of knowing throughout immensity and eternity. We may give imagination the wildest license. We may suppose world after world to have been entered and traversed. Science will never reach a point where there will be no more worlds for her to conquer. Much less will she ever gain a summit from whence she can pronounce the unknown forever unknowable, and quail before it as a mass of contradictions and absurdities. With ever fresh zeal and courage she will make one attainment but the stepping stone to another, still gaining fresh laurels and trophies as she moves on through new fields of inquiry. Even though at length she might fancy the whole complex enigma of creation had been solved, there would still remain the ever knowable yet ever unknowable Creator himself unfolding creation after creation in endless succession.

The Theory of Perfectible Science finally has its foundation in the correlations of the finite mind and the Infinite mind, as well as in the history of the human sciences. If reason and revelation are respectively the functions of the human and the divine intellect, it follows that their interaction ever brings science in contact with omniscience; and since the order of the sciences corresponds to the order of phenomena, their march through space and time is but a review of the creation by the creature for the glory of the Creator.

Such a theory of the sciences, were it clearly and fully grasped, would present an induction at once the grandest and the surest that could be conceived, since the experience which yields it is that of the universal mind embracing the totality of observed facts, and it would be grounded not only upon the uniformity of nature, but upon the very process of reason in the divine and the human intellect. It would simply be the science of man unfolding the omniscience of God.

Not less comprehensive and sublime would seem the logical process of thus perfecting the sciences, were it consciously seized and pursued. It would be nothing less than a universal dialectic of absolute reason, proceeding from its premises in a remote past towards its conclusions in as remote a future. Of such a dialectic we may even be unconscious agents and executives. The sciences may be actually advancing in history on a theory and by a method of which their own votaries as yet are ignorant. They may know as little of the Art as of the Science of the Sciences. As men in common life often reason correctly without being profound logicians, so the race itself, the whole human intelligence, from age to age, may be ever advancing rationally, if not infallibly, towards the goal of perfect knowledge. Nevertheless, even more for the race than for the individual, does the logic of its intellectual conduct become a matter of practical as well as speculative importance, as appears by the success of the inductive logic after ages of mistake and failure.

For this reason, next after the formation of a theory of the sciences may come the study of that Art or Logic of the Sciences, which has been projected as the Second Part of the Ultimate Philosophy.

PART SECOND.

PHILOSOPHY

AS THE ART OR

LOGIC OF THE SCIENCES.

CHAPTER I.

THE LOGIC OF THE EMPIRICAL SCIENCES.

PHILOSOPHY, as the Art of the Sciences, is that General or Universal Logic which formulates the intellectual processes and products of the sciences, not only of the special sciences in both their empirical and metaphysical provinces, but of that supreme Science of the Sciences, which we have projected as the Ultimate Philosophy.

Logic, in its strict sense, the pure science known as Formal Logic, treats of the laws of thought, of association and of reasoning, as seen in the formation of conceptions, judgments, syllogisms, and other mental phenomena; and thus viewed is properly a branch of psychology, or a psychologic science, except as applied objectively in the sciences and arts or in common life.

Logic, however, in its wider sense, the art known as Applied Logic, includes the rules of correct thinking, the principles of evidence and argument, the canons and methods of scientific investigation—in a word, the logic of each special science, and preëminently of the Science of the Sciences.

As an art of the sciences must be based upon a theory of the sciences and proceed in accordance with it, the divisions of Logic in this work will correspond to those required and predetermined by the theory which has been maintained, and will emerge as follows: 1st, The Logic of the Empirical Sciences, both physical and psychical, or Empirical Logic; 2d, The Logic of the Metaphysical Sciences, both physical and psychical, or Metaphysical Logic; 3d, The Logic of the Science of Sciences, both empirical and metaphysical, or Philosophical Logic.

The Empirical or Inductive Logic, though it was vaguely known and practised by the ancients, is of comparatively modern growth and prevalence, dating from the Novum Organum of Bacon, its first great advocate and expounder. Ever since his time it has been cultivated more or less thoroughly in the leading philosophical nations. Among English authorities, William Whewell, as the chief exponent of Bacon, sketched a Novum Organum Renovatum, and elaborated a Philosophy of the Inductive Sciences, except the psychical, which were only theoretically included: John Stuart Mill, the founder of Empirical Logic, has formulated the canons of this inductive method in the physical sciences as arranged by Comte, with the addition of psychology and ethics: Stanley Jevons, in his Principles of Science, has investigated the metaphysical grounds of the inductive process, and vindicated the use of hypothesis or deduction as the complement of induction; while other logicians, such as Whately, Thomson, Bain, Fowler, McCosh, have incidentally discussed or more fully applied the doctrines of these treatises. The chief French authorities are Auguste Comte, whose Philosophy of the Positive Sciences wholly ignores the psychical group except so far as merged in the physical; Ernest Naville, who has treated of the Logic of Hypothesis; Renouvier, who distinguishes the purely logical sciences as deductive, and the physical sciences as proceeding by inductive methods within their phenomenal boundaries; and Bourdeau, who also distinguishes Logic and Mathematics as deductive sciences, and unfolds the inductive processes of the physical sciences as connected in the Comtean series. Whilst some distinguished German authorities, such as Sigwart, George, Fischer, Trendelenberg, Ueberweg, Lotze, and Witte, have incidentally treated of Inductive Logic, others have devoted special works to it, such as Drobisch, who has expounded Logic in its relations with mathematical and natural science; Dühring, who has discussed the methods of acquiring scientific knowledge, the general and special sciences, their history, value, obstacles, construction, nomenclature, somewhat after the manner of Whewell; Scheffler, who has considered the laws of nature in their connection with the principles of abstract science;

and preëminently Wundt, who, in distinction from English and French logicians, has subjected both the psychical and the physical sciences to thorough treatment, as to their cognitive principles and logical processes, so far as their empirical contents are concerned, though he wholly ignores their metaphysical or revealed contents, their doctrines and dogmas, which are in historical if not logical connection with their theories and hypotheses.

It is obvious that the scheme of this work properly requires a system of logic supplying the defects of previous treatises, both as to scope and contents, and largely as to method. But the mere outlines of such a system would demand an amount of space which could be afforded only in another volume, to which, for the present, it must be deferred. Nothing more can now be attempted than to make this volume complete and consistent in its argument. Waiving other irrelevant, though important matter, we must pass at once from the Empirical to the Metaphysical Logic, and from the processes of that logic to its products or at least to such of its extant evidential material as may serve to support the theory of the sciences which has been unfolded in the previous chapters.

CHAPTER II.

THE LOGIC OF THE METAPHYSICAL SCIENCES.

The Metaphysical Logic, as fully treated, would extend throughout both the physical and the psychical regions, as they have been historically surveyed, and would embrace such metaphysical sciences as Natural Theology, including the problems of the Divine Being and Attributes; Natural Religion, including the problems of the Future Life, Moral Government, Probation, and Free-Will; and Revealed Religion, including the problems of Biblical Theology, Anthropology, Soteriology, Ecclesiology, and Eschatology.

The logic applicable to these metaphysical problems is both deductive and inductive. The former treatment of them has prevailed in the schools from the earliest time. The Sophistic logic was wholly deductive from assumed principles of metaphysics without empirical basis or content. The Scholastic logic proceeded from scriptural and patristic dicta as premises to construct by the syllogism an entire system of purely revealed theology. After the Reformation, Protestant divines and thinkers, such as Samuel Clarke in England, and Wolff in Germany, reverted from scriptural to purely metaphysical premises in their treatment of the problems of the Natural Theology as distinguished from the Revealed, and essayed to solve them by demonstrative reasoning. Though Kant undermined the metaphysical foundations of such theism, his successors restored them, and at length Hegel, identifying logic with ontology, involved both revealed and natural theology in the sweep of his all-embracing dialectic. Since that time the German metaphysic has been almost discharged of its revealed contents, or has retained only their ghostly semblance in

fantastic world theories that have as little empirical basis in Nature as in Scripture.

The inductive logic as applied to religious problems, dates from the time of Bishop Butler, who has moulded English thinking in the sphere of revealed religion as powerfully as Lord Bacon in natural science. According to Butler, Analogy, the reasoning from facts to others like them, is superior to mere Hypothesis or Speculation, the reasoning from false or inapplicable principles, and when employed in religious inquiries will yield the high probable evidence upon which we ever proceed, as well in scientific investigations as in common life. By means of such inductive reasoning he essayed to bring the whole course of natural and revealed religion into logical accordance with the known course of Nature, and thus render it as scientifically probable as the Copernican theory of the solar system, or any other theory of exact science. The logical processes of such Analogy in his day had not been described and formulated into canons, as other branches of logic have since been treated. Nor have they yet been thoroughly investigated and justly esteemed. His harsh, uncouth style, involved sentences, and quaint phraseology, together with the inevitable treatment of his work as a mere apologetic, have been barriers to a just appreciation of its strictly logical character and scientific claims as a treatise on the philosophy of religion. Whilst its evidential value has often been recognized by both laymen and divines, such as Chalmers, Fitzgerald, Dike, Steele, Brougham, MacIntosh, Argyle, Gladstone, Patrick Henry, Wayland, Emory, Malcom, Barnes, yet its philosophical value, especially in its treatment of the problems of revealed religion, is still to be fully appreciated.

A few tentative works only as yet have appeared. Cardinal Newman, in his "Grammar of Assent," has acutely discussed the relations of natural to revealed religion, in the spirit of Butler, after setting forth the tests of moral certitude and the logical processes implicated in the formation of religious opinions. Dr. Buchanan, in his treatise, "Analogy, a Guide to Faith," has led the way to an investigation of the metaphysical grounds and logical processes of religious analogy. Mr. Josiah Miller, in his "Christianum Organum," has

claimed that the moral basis of the inductive method is essentially Christian, and that the method should be as rigorously applied in the study of Scripture as of Nature. Professor Joseph P. Cooke, in his lectures on "The Credentials of Science the Warrant of Faith," has shown with admirable force and clearness that the systems of science and religion rest upon the same fundamental beliefs, and proceed by the same inductive method to their ultimate conclusions. But a thorough treatise on the logic applicable to religious problems is still a desideratum. Mr. Balfour, indeed, declares that a philosophy of belief, not of religious belief exclusively or even principally, but all belief, in science as well as religion, has yet to be constructed.

As our present aim is philosophic rather than apologetic, a word will here be in place respecting the philosophical value of apologetics and especially the relation of apologetics to philosophy as projected in this work. In general it may be said that apologetics can enter into the construction of the Science of the Sciences only as any other branch of applied logic can enter into it—that is, in a purely philosophical spirit, without any dogmatic, sectarian or partisan aim. The apologete must come into the wide realm of philosophy, if he come there at all, not as a mere apologete, defending his own religious creed, whatever that may be, but as a philosopher, seeking the whole truth wherever it is to be found, in Nature as well as in Scripture, and by all available means, by revelation no less than reason. If it be objected that some philosophers are theologians; this is like saying that judges are lawyers. It is the judicial temper or the philosophic spirit which makes the essential difference. And that it is possible thus to change the advocate for the umpire, even in the same field of inquiry, has been shown by so eminent civilians and divines as Locke, Descartes, Leibnitz, Berkeley and Butler, who were philosophers as well as apologists, and have treated even apologetic questions in a philosophical spirit.

But more specifically it may be said, that the labors of the apologete, besides their primary religious value, have also a secondary philosophic value and admit of a philosophical use

which he never intended, which he may even repudiate, but which nevertheless is not to be despised, because it may be of less obvious and direct utility. In a word, his labors may serve to ascertain one of the legitimate elements and chief factors in the science of the sciences,—that theory of revelation which we have found to be involved in their growth and completion; and the evidences which he collects, though often crude and unserviceable, may afford valuable materials to be wrought into that system of perfect knowledge which we have termed the Ultimate philosophy. The truth is that the apologist is ever aiding the philosopher, albeit unwittingly to them both, in the logical construction of the sciences. It should be remembered that in so vast and complicated a work, many laborers must be successively as well as simultaneously employed, in different ages and countries, each with his own task; some toiling in the quarry; some laying the foundations; some chiselling blocks for the architrave; and all building better than they know. So that in the finished structure will doubtless be wrought here and there a corner stone which even the apologist has rejected as well as some chance boulder which the infidel has hurled from his catapult.

In the plan of that structure, as it may be projected in thought, the apologetical logic will serve as a massive buttress to the metaphysical segment of the sciences, corresponding to the inductive logic which sustains their empirical segment. But the builders have yet to perceive their common aims and realize their common task. As there are still many scientists who oppose or ignore important revealed truths, so there are still many religionists who oppose or ignore important discovered facts; and to not a few in each class the separate systems of knowledge which they are rearing may now seem like hostile ramparts, with a dark and impassable chasm between. Yet in the long future the day may come when, in the view of both classes, they shall prove to have been but the rising piers of a completed arch, having one base in Butler's Analogy and the other in Bacon's Organum, with a perfected Christian science as the triumphal key-stone.

Waiving for the present any special treatment of the grounds, methods and canons of apologetical logic, we must proceed to a brief inventory of its existing products in their proper order of treatment, first the evidences of Theism in general metaphysic science, and then the evidences of Natural Theology in the physical sciences, the evidences of Natural Religion in the psychical sciences, and the evidences of Revealed Religion in the science of religion as crowning and involving all the other sciences.

SECTION I.

Evidences of Theism in General Metaphysic Science.

As the problem of theism has been largely discussed already, we shall simply enumerate the general metaphysical proofs which have reigned in the schools and reserve for the present their elaboration. They are of two classes; the *a priori* or deductive, derived from axioms and general principles, and the *a posteriori* or inductive, gathered from observation and experience. The former class fall into three groups; first, the Ontological, founded upon the intuition of being as necessary and perfect in one absolute existence; second, the Cosmological, founded upon the intuition of cause as necessary and sufficient to produce the world of order as an effect; third, the Psychological, founded upon the intuition of will as causative and efficient and upon the subjective ideal of a Perfect Being as requiring an objective reality. These proofs taken together yield at least the logical conception of an Infinite and Absolute Person or Creator as the intelligible cause of the universe.

The *a posteriori* proofs also fall into three groups; first, the Teleological, afforded by the observation of means and ends or final causes or design in nature as implying an intelligent Designer; second, the Moral, afforded by the consciousness of moral design or by the conscience as requiring a moral Governor; third, the Historical, afforded by the universal consensus of religions in an essential theism as common

to all forms of pantheism, polytheism and monotheism, both heathen and Christian.

The practical order of the two classes of proofs is the reverse of their logical order. Inductively we first ascertain the fact of an intelligent and righteous Author and Governor of the world, and then deductively proceed to attribute to Him those notions of infinity, absoluteness and causality, which even the atheist has in common with the theist, and which philosophy furnishes no less than religion. With this conception derived from general metaphysics, we may then enter the special sciences for detailed proofs of the Divine being as well as for illustrations of the various divine attributes.

SECTION II.

Evidences of Natural Theology in the Physical Sciences.

Astronomy, on the basis of the theistic theory of the world, affords an illustration of those natural attributes arising out of the relations of an infinite, absolute Will and Mind to illimitable space, time, force and matter, such as immensity, eternity, immutability, omnipotence, omniscience.

With the rise of the modern astronomy such conceptions were inevitable, if not irresistible in all religious inquirers. The earlier astronomers themselves, such as Copernicus, Kepler and Newton, did not scruple to mingle pious reflections with their scientific discoveries. Richard Bentley, the first Boyle Lecturer, in his sermons on the "Confutation of Atheism" from a survey of the origin and frame of the world, expounded the Principia of Newton against the Epicurean doctrine of eternal matter and motion, at the same time unfolding scientifically that ancient proof of the divine beauty and order of the firmament, the cosmos and mundus, which kindled the adoration of Plato and Cicero no less than of Moses and David. William Derham, the learned Canon of Windsor, whose once popular "Astro-theology," seems to have been the first distinct treatise of the kind, also demon-

strated the being and attributes of God from a survey of the heavens, especially enlarging upon the usefulness of the celestial globes as then for the first time becoming apparent in their ascertained figures, motions, orbits, and attractions. The versatile Whiston, in like manner, treated of the "Astronomical Principles of Natural and Revealed Religion," on the basis of the Newtonian philosophy. And the same argument was continued by Ray and Paley. Dr. Whewell, in his Bridgewater Treatise on the "Connection of Astronomy with Natural Theology," still more scientifically vindicated the benevolent design of the cosmical arrangements against the insinuation of La Place that it was easy to conceive of a better solar system. The late Professor Ormsby Mitchell, in his "Astronomy of the Bible," not only sought to illustrate the divine omnipotence, eternity, immutability, and wisdom from the celestial mechanism, but to discern an occult inspired acquaintance with it in the very language of the Scriptures. It has been claimed that the Hebrew expression in Job, "the sockets of the earth" implied a knowledge of its diurnal rotation, and that in the binding "influences of the Pleiades" there is an anticipatory allusion to the revolution of the solar and other astral systems about a centre of universal gravity, which Mädler has placed in that constellation. The author of the ingenious little treatise, "The Stars and the Earth," has derived an illustration of the Divine omniscience and Book of Judgment from the velocity of inter-planetary light, by supposing an observer receding from star to star, with an increasing vision of events after their occurrence, and thus enabled to review the entire history of the earth from the present day to the time of Christ, from thence to the calling of Abraham, to the Flood, back to the new-born world, with the morning stars shouting over it for joy.

As the geological sciences have advanced, the true theistic argument has become cumulative and bewildering in its magnificent richness. Evidences have been collected not merely of benevolent design, but of supreme intelligence in the mathematical order, the geometrical symmetry, the optical beauty, as well as the wonderful utility which pervade the whole terrestial system. Dr. John Kidd, in his Bridgewater

Treatise on "The Adaptation of External Nature to the Physical Condition of Man," with reference to the supply of his wants, starting with a view of his comparative helplessness, has ranged through the atmospheric, the mineral, the vegetable, the animal kingdoms, coördinating an immense series of facts in proof of the wisdom and goodness of the Creator. Dean Buckland, in his Bridgewater Treatise on "Geology and Mineralogy," with reference to Natural Theology, beginning far back in time with the molten earth, has traced its forming layers of rock, metal and coal as designed for future use, together with the monster floras and faunas adapted to its changing climates, ere it was fitted to become the abode of man. The same argument has been unfolded with scientific candor and learning, as well as devout enthusiasm, by President Hitchcock in his "Religion of Geology and its Connected Sciences." Professor George Fowne, in his Actonian Prize Essay, has exemplified the wisdom and goodness of God in the chemical history of the earth and its atmosphere, and in the marvelous adaptation of its inorganic substances to the organized beings which tenant its surface. On the same foundation, a like illustration has lately been drawn by the Rev. George Warrington from the phenomena of radiation. Professor J. P. Cooke, in his Graham Lectures on "Religion and Chemistry," has gathered fresh testimony from the beneficent uses of oxygen, carbonic acid, nitrogen and all the constituents of air, earth and water. Professor Guyot, in his Lowell Lectures on "Earth and Man," has sketched the wonderful pre-adjustment of the whole physical structure and furniture of the finished globe to the races and civilizations which have been cradled in its genial continents, nourished by its cloudy mountains, fanned with its balmy winds, and wafted, with growing wealth and power, across its mighty seas.

The invisible beauties of nature, as well as its more obvious utilities, have also been unveiled by the hand of a devout science. The distinguished mathematician, Charles Babbage, in his "Ninth Bridgewater Treatise," sought to illustrate arithmetically, by means of a calculating machine, after the manner of Paley, that divine forethought and design which

pervade the evolution of the whole terrestrial mechanism, under both law and miracle, and unfolded a secret Book of Remembrance in those ethereal waves of light and sound which perpetuate the impression of every word and deed of man. President Hill, of Harvard, has in like manner united Geometry and Faith, by exposing those vast, intricate problems of form and motion, with which an Infinite Intelligence is ever tasking the devout student of nature. President McCosh, with the aid of Professor Dickie, in his "Typical Forms and Special Ends," whilst not undervaluing the utilitarian arguments of other writers, has chiefly aimed to blend the evidence of order and beauty with that of adaptation and use, as found in the subtle harmonies of number, form and color which lurk in the crystal, the plant, the animal, gleam in the most hidden atoms and particles, and thus transform the whole earth with a divine intelligence and glory. Principal Dawson, in his "Archaia," has sought to derive an exact cosmogony and natural history from the very text of the Hebrew Scriptures as interpreted by the physical sciences.

The theistic argument of the anthropological sciences, as hitherto pursued, has been made to embrace the evidence of wise and benevolent purpose both in the special structure of man and in his physical relations to the whole animate creation. As early as the fourteenth century, according to the Jewish authorities, Albo, a Castilian rabbi, anticipated many a famous argument since his day, by illustrating the far-reaching care of God in providing for the perfectibility and preservation of the animal and human species. Archdeacon Paley, though he did not neglect other provinces of natural theology, devoted himself specially to the admirable mechanism of the body, as illustrated by that of a watch, to examples of prospective contrivance for the care of the young, to the phenomena of instinct, to the marvellous adaptations and compensations among the different organs of the animal economy, and to the more general relations between all animate and inanimate nature. The Rev. William Kirby, in his Bridgewater Treatise on the "Creation of Animals," dwelt with careful minuteness upon the functions and instincts of infusories, polyps, radiaries, cephalopods, etc., as alike resplendent

with marks of divine wisdom. Dr. Peter Mark Roget, in his treatise on "Animal and Vegetable Physiology," enlarged upon the benevolent intention of the Creator to secure the welfare of individuals, as seen in the conservative and reproductive functions, both mechanical and vital, of the different species of mollusca, articulata, and vertebrata. Dr. William Prout, in the treatise on "Chemistry, Meteorology and Digestion with reference to Natural Theology," drew his argument from the pre-adjusted proportions of air, water and land, for the sustenance of life, the adaptations of climate to the inhabitants of the different zones, the correspondence between the external mechanical organs and the internal digestive functions of carnivorous or herbivorous tribes, and the vital relations between plants and animals in the general economy of nature. Sir Charles Bell, crowning this series of treatises with his masterly monograph on "The Hand," has traced its beneficent design as the distinguishing member in the human frame, the organ of touch and sensibility, the instrument of mechanical and artistic skill, and the prime mover in all progress and civilization. In our own day, and with a direct bearing upon current speculations, Professor Henry J. Clark, in his work on "Mind in Nature," has made it his aim to refer the origin of life and the development of animals to a foreknowing Power in the universe, which predetermines and attends all successive and contemporaneous vital phenomena. And indeed the chief authorities in comparative zoölogy, from Linnæus to Agassiz, have never scrupled to recognize a divine wisdom not merely in each organ and function, but in that whole organic scale of advancing types which at length become recapitulated in Man as he stands at the summit of living nature,—

> "The beauty of the world! the paragon
> Of animals!"

SECTION III.

Evidences of Natural Religion in the Psychical Sciences.

The proper theistic argument of the psychological sciences has been made to include proofs of the divine goodness and justice both in the mental constitution and in its wonderful correlations with external nature. The earlier theists, more especially occupied with the physical sciences, only touched incidentally upon the argument. The two Balguys, father and son, seem to have been the first to attempt it with their treatises on Beauty and Virtue, and the Divine Benevolence vindicated against sceptics. The didactic poets, from Akenside to Campbell, may have practically promoted it by their strains upon the pleasures of Imagination, of Hope, and of Memory. Paley, in his chapter on the goodness of the Deity, has sketched the superadded pleasures of animal sensation in youth, and age, through summer and winter; the peculiar enjoyments of rational beings in the exercise of choice, the acquisition of property and the pursuit of knowledge; and the philosophical alleviations of the moral enigmas and evils which distress the reason and conscience. Butler announced the foreseen pains and pleasures of moral actions to be the evidence of a divine Lawgiver, and the actual rewards and punishments of His government. Dr. Chalmers, in his Bridgewater Treatise on "The Adaptation of External Nature to the Moral and Intellectual Constitution of Man," after carefully distinguishing the nature of the reasoning, has gathered proof of the Divine wisdom, goodness and justice from the different faculties and laws of the mind, the pleasures and miseries of its virtuous and vicious affections and habits, and the corresponding provision in the whole material and social system for gratifying and disciplining its higher powers and capacities.

President McCosh, in his chapter on the correspondence between the mental and the material worlds, has traced evidences of their preëstablished harmony in the images of the fancy, the conceptions of the understanding, and the constructions of the imagination as together conspiring to secure the

welfare of man and the glory of the Creator. The Rev. Henry Wace, in his recent Boyle lectures on "Christianity and Morality," has reinforced the argument from conscience for a personal God, moral Creator, and spiritual Governor of the world, in answer to the doubts which have been thrown upon such reasoning. It is not improbable that the new evolutionist school of physical science may yet offer fresh theistic proofs of an absolute Mind foreseeing and directing the development of thought as well as of force. And indeed all the great, comparative psychologists, from Leibnitz to Coleridge, and to Lotze, have never failed to perceive a divine wisdom in each mental process and law, as well as in those high accessional perfections of the human spirit, the will, consciousness and reason, which surmount mere instinct, sensation and life.

The true theistic argument of the social sciences is beginning to embrace as its field the whole history as well as organism of humanity. The way may be said to have been opened by such historians as Bossuet and Prideaux, who have discerned a universal Providence of mingled justice and mercy in the fortunes of nations as well as individuals, and by such political dreamers as Thomas More and Campanella, who have projected ideal commonwealths which would realize the communism of the Apostles and the predicted kingdom of the Messiah. Butler, in his chapter on the Moral Government of God, has traced its deep and broad foundations in the natural rewards of prudence and rashness, of beneficial and mischievous actions, and of virtue and vice as such, as well as in the inherent tendency of the virtuous class to predominate over the vicious in an ideal society which may exist elsewhere in the universe, which was actually promised to the Jew and the Christian, and is yet to be fully realized in the progress of mankind. Chalmers, in his Bridgewater Treatise, has continued the argument of Butler, by explaining the social affections which secure the civil, political and economic well-being, such as the ties of kindred, friendship and patriotism, the rights of property, the humane instincts of charity and philanthropy, and by recounting the public blessings which ever attend the prevalence of virtue,

and if fully developed would convert the world into an elysium. President McCosh, in his "Method of the Divine Government, Physical and Moral," a work worthy to be classed with the former, has proceeded to illustrate the divine holiness and justice as well as wisdom and goodness, the moral no less than the natural attributes, in the laws and penalties of Providence, in the crimes and miseries of humanity, and in the vindication of the former and restoration of the latter through the revealed scheme of redemption. It was one of the prescient hints of Bishop Butler that the whole historical evolution of the Christian system from the beginning of the world has proceeded under general laws in analogy with the secular processes of nature; and a new class of theistic proofs may yet be gathered, as we see the mineral, vegetable and animal economies of divine wisdom and goodness through the geological ages gradually surmounted through the four great historical eras, from the Fall to the Flood, to the Incarnation, to the Second Advent, by successive spiritual economies of divine justice, forbearance, mercy and love, in one vast scheme of social as well as individual regeneration.

In theology, as the final science of religions, the evidences of natural religion appear as logically fundamental and preliminary to Revealed Religion, which has become the chief problem of the new empirical science of Comparative Theology.

SECTION IV.

Evidences of Revealed Religion in the Science of Religions.

The Evidences of Christianity, by the very fact of their existence, afford a strong presumption in its favor. They place it before the world as at least claiming to be founded in truth and suited to the reason of man. Had it made its way by mere force and policy, or did it now require assent without testimony and argument, there would be no need even to investigate its merits. It might be classed at once with the false religions which are confessedly without reason-

able evidence, if not beneath discussion. But in distinction from all other systems it possesses a recognized body of proof which has been accumulating for eighteen centuries under the most varied and searching criticism, and which, when examined, is found to be all that the case admits or that an intelligent inquirer could demand. Such an inquirer may therefore be challenged at the threshold to acquaint himself with the history of the Christian evidences before he proceeds to judge them in detail.

The history of Christianity is, in one view, but the history of its evidences. Externally at least, its course through the world has been marked by successive crises, when it encountered various forms of incredulity which it became necessary to repel with suitable evidence; and out of every conflict it has emerged with a triumphant vindication of its claims and a fresh contribution of proof to after generations.

Its first conflict was with Judaism. On its native soil and at its very origin it excited the bitter unbelief of the Jewish rulers and people, who repudiated it as an impious caricature of their own ancient religion, stigmatized its author as an impostor or false Messiah, and at length compelled him by the death of the cross to become the first great martyr to its truth. Judaism, as a distinct system, from that moment declined into a mere dead tradition, and has since, by its own predicted fate, served but as an unwilling witness for that Christianity which has been spreading over the globe and becoming the common heritage of all nations and races. The life and death of our Lord, including his discourses, parables, and miracles as recorded in the four Gospels, constitute the evidences of Christianity afforded at its origin.

Its second conflict was with Paganism. No sooner had it been proclaimed as a gospel to the nations than it encountered the decaying religions of Greece and Rome, which desperately rallied against it as a common enemy. But its course from city to city was marked with crowds of converts, as well as with persecutions and conflicts, everywhere accelerating the decline of those old mythologies, which now figure only in the classic literature made tributary to its own defence and illustration. The planting and train-

ing of the Church, as narrated in the acts and epistles of the apostles, together with the Apologies of Justin, Tatian, Athenagoras, and Theophilus, yield the evidences belonging to this period.

Its third conflict was with Philosophy. So long as it was contending practically with mere Jewish or heathen superstitions, the learned class could treat it with disdainful silence, and great writers like Plutarch, Seneca, and Tacitus alluded to it only in the most casual manner; but as its exclusive claims gradually became known, its advance was met by an infidel wing of the Neo-Platonic school, led by Celsus, Porphry, and Hierocles, who assailed it as a vulgar imposture, and at length provoked the series of bloody persecutions which filled the cities of the Empire with Christian martyrs. Its apparent defeat, however, was followed by a victory almost ruinous. It had already won from the very ranks of Plato its first great apologist, Justin Martyr, and it now wrested so much of philosophy itself as could be wrought into its own theology; and at length appeared upon the throne of Constantine as the visible head of a new Christian civilization. Besides these wordly trophies, its direct evidences for this period are to be found in the testimony of the martyrs and the apologetical writings of Tertullian, Clement, Origen, Eusebius, Cyril, Arnobius, Lactantius, and Augustine.

Its fourth conflict was with Barbarism. In the Dark Ages following the barbarian conquest and the wreck of the Roman empire, though it was now deprived of all worldly power it subdued by mere spiritual force the rude religions of the North as it had already vanquished the classic mythologies of the South, and treasured up from the civilization of the past all that was valuable for that of the future. While contending with such savage foes it could have no other evidences than such as appeared practically in the Germanic missions and in the great Christian schools of the Middle Ages.

Its fifth conflict was with Mohammedanism. The Saracen was invading its domains with the sword and the Koran from the East to the shores of Spain; but the fierce Goths, whom it had trained into Christian knights, now by successive cru-

sades battled for the tomb of the Saviour, until Europe was delivered from the infidel. Its evidences for this epoch were all that could be expected—the exploits of Christian chivalry, the prizes wrested from Arabian learning, and the apologetical writings of the Schoolmen against the Jews and Mohammedans in Moorish Spain.

Its sixth conflict was with modern Rationalism. Divided at the Reformation into Catholicism and Protestantism, it encountered a treacherous foe which for several centuries past, under various guises, has been subjecting its divine revelations to the test of mere human reason. But hitherto the strength of its evidences has only been proved by each successive assault. The Italian naturalists of the sixteenth century, such as Pomponatius, Cæsalpin, and Cremoninus, who held Aristotelian opinions subversive of revealed religion at the very court of Rome and under feigned respect to the Church, wrought their own defeat by their shameless hypocrisy and vice. The English deists of the seventeenth century (such as Herbert, Hobbes, and Toland), and of the eighteenth century (such as Collins, Tyndal, and Bolingbroke), who professed mere natural religion as essential Christianity, were so completely repulsed by the great apologists, Cudworth, Bentley, Berkeley, and Butler, that their very works have become obsolete or linger only as brilliant names in literature. The French atheists of the last century, such as Helvetius, Diderot, D'Holbach, who assailed Christian morality itself with a sensual fatalism, only precipitated that terrible Revolution which has made them infamous as enemies of civilization, no less than of religion. The German pantheists of the present century, such as Strauss, Baur, and Feurbach, who have been striving to resolve Christianity into mere mythology, were routed on their own ground and with their own weapons by such learned and acute writers as Neander, Ebrard, and Ullmann. And it is safe to predict that the sciolists of our own day, who are opposing it with science, falsely so called, are but ensuring a like failure and defeat.

But its still remaining and perhaps its final conflict is to be with modern Heathenism. Having developed for itself

in the western nations of Europe and America, during the last eighteen hundred years, a civilization the highest the world has yet ever seen, it would be strange if it could not now cope with those eastern nations of Asia and Africa, which meanwhile have remained stationary or relapsed into a savage state. And accordingly, for the last half century, it has been slowly enveloping the globe with a network of missions, which, in connection with advancing science, commerce, and diplomacy, already betoken the ultimate triumph of Christian civilization over heathen barbarism throughout the earth.

On reviewing now the evidences which have thus been accumulating during this exciting history, we at once become embarrassed by their richness and fullness. Much ingenuity, in fact, has been exercised in digesting and arranging them, but the most common and serviceable classification is that by which they are divided as external and internal, with suitable subdivisions. The External Evidences are such as relate to the fact or existence of Christianity, rather than to its nature or system—the mere credentials of revelation as distinguished from its contents. They will naturally distribute themselves into the following groups: 1st, Prophecies, which have been fulfilled in the course of ancient empires, in the coming of the Messiah, in the fortunes and fate of the Jews, and in the progress of the Christian Church; 2d, Miracles, which were wrought by prophets and apostles in attestation of their divine commission as teachers, disclosed in the life and death of Christ, the son of God, and confirmed by the supernatural success of Christianity in the first age; 3d, Historical Testimonies to the authenticity and genuineness of the sacred writings, afforded not only by undesigned coincidences among them, but by contemporaneous heathen literature and by modern antiquarian research. Collections of the first kind of evidence may be found in the works of Newton and Keith; of the second, in those of Watson, Sherlock, Lesley, and Campbell, in reply to Gibbon and Paine; and of the third in those of Lardner, Paley, Norton, Greenleaf, and Rawlinson.

The Internal evidences are such as appear in Christianity itself, in the purport of the revelation which has been so miraculously attested. An argument for its divine excellence

may be traced in all that distinguishes it from other mere human systems: 1st, in its doctrines, transcending the highest philosophy, such as the existence, perfections, and policy of the Creator, the origin of the world, the scheme of redemption, the state and destiny of man; 2d, in its precepts, surpassing the purest ethics, such as the Ten Commandments, the Sermon on the Mount, the counsels of the apostles; 3d, in its examples, unapproached by worldly heroes, such as those of evangelists, saints, and martyrs, and above all the immaculate Jesus himself; 4th, in its effects, not only upon the welfare of individuals, but upon the interests of society, as seen in the works of charity and philanthropy, in the arts of peace, in human laws and free institutions, and in the entire civilization which for centuries has been unfolding. Specimens of such arguments may be found in the treatises of Jenyns and Warburton, of Archibald Alexander, Hopkins and McIlvaine, and of Luthardt and Delitsch.

Still further classes of evidence are of a mixed nature, being partly external and partly internal, and serving to show the connection and consistency of Christianity with other facts and truths. They also may be indicated under several heads: 1st, Experimental evidences acquired by those who have personally tested in their own faith and practice the doctrines, precepts, and promises of the gospel, and thus offer new and original testimony; 2d, Scientific evidences, collected from the sciences which illustrate the existence and attributes of the Deity, and confirm the incidental allusions of Scripture, to physical, mental, and moral phenomena; 3d, Philosophical evidences, derived from right reason and large experience as to the probable existence of a Divine government, a future state, a supernatural revelation, and a scheme of redemption, such as are found in the Scriptures, and also from the view of religion and nature as but consistent parts of one system, having the same Author. Examples of such high orders of evidence may be seen in the works of Locke, Browne, Butler, Paley, Zöckler, the Bridgewater Treatises, and the recent Bampton Lectures.

These various classes of evidence, when grouped together in one view, tend to produce a conviction which has been

likened by Bishop Butler to what is called the effect in architecture or other works of art. Examined separately, they may excite as little emotion as scattered stones upon a plain, but when combined, as they have been by this great Architectonic genius, in one compact, cumulative argument, their resulting impression is like that of the same materials after they have been chiselled and fashioned into a magnificent building. But we already trench upon the next topic.

A far more important question than the mere classification of these evidences is that of their logical nature and value. Viewed from this point, they must ever take rank as the highest branch of applied logic, as well for the difficult problems which they involve as for the kinds of reasoning employed. And the practical bearing of the enquiry is shown by the fact that different apologists, in treating of the evidences, have more or less consciously exaggerated one class of them at the expense of the other, until like a divided army wrangling in the face of an enemy, they have allowed infidels to involve both of them in doubt and suspicion. Of the two evidential schools which have thus taken opposite grounds, the one would render Christianity reasonable, the other present it as simply credible; the one would claim for it demonstrative evidence carrying full conviction, the other seek only probable evidence accumulating toward certainty; the one would dwell upon the internal philosophical proof, the other upon external historical testimony; and at length the one ends in testing the whole content of revelation by mere reason, whilst the other virtually destroys all rational conditions of faith. The former method has been successively pursued to its extreme by Descartes, Clarke, and Wolfe, and the latter by Butler, Chalmers, and Mansel.

It is enough here to assert the validity of both methods within the limits they impose upon each other. Each has had its value at different times and for different minds. The primitive apologists needed the external evidence for the Jews, who required a sign, as well as the internal evidence for the Greeks who sought wisdom. And from that day till the present there have been infidels who were won by the doctrine and example of Jesus before they could admit his

miracles, as there have been believers who ceased to find difficulties in Scripture after they had accepted it as an attested revelation. The simple truth is, that neither kind of proof can be spared from the high argument, and that both must be ultimately combined in order to ensure full conviction.

At this point the logical question we are considering begins to involve an ethical or moral element. It should be carefully observed that the apparent deficiency in the Christian evidences neither necessitates unbelief nor releases from obligation. On the contrary, the inquirer simply becomes accountable in proportion to the evidence perceived and the interests at stake. He is still to be tested and judged by the light which he has. Moreover, his incredulity may be his own fault. It is certain that the Christian evidences have hitherto proved sufficient for the greatest minds of the race. Are they now on the wane or on the increase? This is the remaining question.

A distinguished mathematician of the seventeenth century, John Craig, professed to calculate, on the hypothesis that the suspicions against historical evidence increase with the square of the time, that the evidence of Christianity will become extinct about the year 3150, when the Son of man will come and no longer find faith on the earth. And a school of modern skeptics, including poets as well as philosophers, is already sighing over the decay of Christianity as but the last of the world's mythologies, destined to be superseded by the perfect religion of the future. If all that is meant by such writers is the decay of their own Christian faith, it need not be denied that many restless speculative minds are breaking away from their moorings in false creeds and corrupt systems claiming to be Christian; but if the apprehension is that Christianity itself is dying out or losing its hold upon the world, such forebodings are to be no more seriously treated than the outcries of men losing their anchorage who fancy it is the immovable shore and not their own little vessel that is drifting away. Christianity has in fact lost nothing of the evidence which it has been accumulating since the time when first its miracles were wrought and its prophecies spoken.

Not only does the testimony to these miracles remain unimpeached, not only is the fulfilment of those prophecies still passing before our eyes, but the human sciences since then unfolded are yielding it a new class of evidences, affording it fresh confirmation and illustration, and commending it to the highest intellect and culture of the time; and the reasonable presumption is that, one after another, they will yet corroborate all revealed facts and doctrines, until everywhere there shall be an intelligible triumph of the Divine through the human reason over all earthly error and sin. That such an increase of evidence in this quarter is probable may be argued from the very nature of science and revelation as complementary factors of knowledge. It is inconceivable that the word of God should contradict his works, or that human reason could supersede a divine revelation; and when any discrepancies appear between Nature and Scripture, we must simply assume that there has been some wrong induction from either or both of them, and that ultimately, after the whole truth is known, they will confirm and illustrate each other. This has, in fact, been the result of past conflicts between the scientific and religious parties. Geography, in the early Church, repudiated the idea of an inhabited globe as contrary to the Scriptures, but ships now carry the same Scriptures to the antipodes. Astronomy, during the Middle Ages, described the heavens as huge crystal spheres revolving about our earth, but the very same heavens as devoutly interpreted by Kepler, Newton, and Herschel, still declare the glory of God. Geology, of late years, has seemed inconsistent with the long-received interpretation of Genesis, but the story of the earth itself, as read by Miller, Hitchcock, and Guyot, still tells how it was made in six days. Anthropology, at the present moment, is full of conflicting theories, some of which menace the Scripture doctrine of the first Adam, but he must simply prejudge the whole question against all precedent who asserts that man was not made in the image of God. And in the region of the mental, moral, and social sciences, where the need and fact of a revelation are so much more obvious, the likelihood increases that there will hereafter be still higher and grander illustrations of Christian doctrine.

It is an encouraging sign of progress in the evidences of Christianity that so many organized efforts are on foot for their promotion, and some of them in the interest of true science as well as true religion. The Royal Society itself was founded by philosophers and divines who vindicated the consistency of natural with supernatural knowledge. Other institutions have followed, expressly designed for the defence of the Christian religion, such as the Boyle Lectures, the Bampton Sermons, the Bridgewater Treatises, the Burnett Essays in Great Britain and the Lowell, Graham, and Ely Lectures in this country, together with more permanent educational appliances, such as chairs of Christian apologetics in divinity schools and of science and religion in our colleges. To these should be added the publications of the Victoria Institute or Philosophical Society of Great Britain and of the American Summer School of Christian Philosophy founded by Dr. Deems. Among Roman Catholic authorities, the Abbé Migne has published a series of twenty volumes, 4to, entitled "Demonstrations Evangeliques," containing a full collection of the principal evidential treatises, of all schools in all ages, chronologically arranged, as a work equally important to the infidel, to the skeptic, and to the believer.

CHAPTER III.

THE LOGIC OF THE SCIENCE OF SCIENCES.

The Logic of the Science of the Sciences, more compactly termed Philosophical Logic, should include three sets of logical rules or canons: the first, applicable to the normal relations of reason and revelation and ensuring the ideal harmony of science and religion; the second, applicable to the existing relations of reason and revelation and governing the provisional adjustment of scientific hypotheses, and religious dogmas: and the third applicable to the prospective relations of reason and revelation and regulating the conversion of conflicting hypotheses and dogmas into harmonious theories and doctrines in an ultimate system of perfected sciences and arts. Only the first class of these canons will here be presented.

The Philosophical Logic, as proceeding upon that theory of the sciences which we have maintained, will involve certain assumptions which should now be recalled and clearly set before the mind as results of the previous discussion and the basis of the whole subsequent investigation.

First of all, we may assume the validity of reason and the authority of revelation; the former as the human power of knowing the knowable and the latter as the divine power of making known the otherwise unknowable. Let it be granted that there is a human intellect and a divine intellect, both trustworthy, distinct in their ordinary cognition, though somehow correlate in the extraordinary process of revelation; and basing their legitimacy upon the overwhelming evidences of it which have been accumulating for thousands of years, we are now to fix our attention upon those two great extant

bodies of knowledge issuing from them, the one rational and the other revealed, known popularly as Science and Religion.

We must also assume, what most clear thinkers now perceive, a radical distinction between the phenomenal and the noumenal elements of cognition or between the empirical region of the conditioned and finite and the transcendental region of the absolute and infinite. All modern philosophy is built upon this distinction. It is no longer possible to speak in any philosophical tongue without using it. To undervalue it is to betray ignorance or confusion of thought, and to dispute it would be a mere logomachy. Even that crude gnostic, who styles himself a common-sense philosopher and boasts of knowing things as they are, soon finds how largely he only knows them as they appear, though he may not distinguish the phenomenal from the noumenal portion of their reality; whilst the more subtle agnostic would claim the former as alone knowable and certain, and renounce the latter as wholly unknowable and illusory. Between these extremes are the sound thinkers who hold both to be knowable, though in different ways and degrees, the one through sensation and experience and the other through intuition and revelation, and the practiced investigators in the sciences who proceed upon the same distinction in their search for the patent laws rather than the occult causes of phenomena and sooner or later call a halt at the boundaries which divide the physical from the metaphysical, the empirical from the transcendental realms of inquiry.

As a further preliminary we need to recall the sciences in that serial order to which they have been tending in their own historic development, as well as in the view of the most advanced thought; an order required by the successive classes of phenomena to which they respectively refer, first the physical, then the chemical, then the organical, next the physical, then the social, lastly the religious; the higher recapitulating the lower and the lower supporting the higher in the series as above stated. Taking from each of these groups its most typical and capital science, astronomy from the physical group, geology from the chemical group, anthropology from the organical group, and psychology, sociology

and theology from the remaining groups, and then dividing them into their empirical and transcendental sections, with both sections embraced in philosophy as the comprehensive science of the sciences, we shall have the following tabular view of our present field of investigation :—

PHILOSOPHY.

Empirical Science of phenomena and laws.	Theology. Sociology. Psychology. Anthropology. Geology. Astronomy.	*Metaphysical Science of essences and causes.*

Now the problem before us is, to ascertain, as far as may be, the logical relations of reason and revelation in this series of sciences. Let that problem be clearly stated. There is in each science an empirical section and a metaphysical section, a region of phenomena and laws which the finite mind of man is competent fully to explore and a region of essences and causes which the infinite mind of God alone can fully disclose, a discoverable portion of knowledge and a revealable portion of knowledge, in short, a province of reason and a province of revelation. Thus placing divine revelation mainly on the transcendental side as an approved mean of knowing the absolute and infinite and retaining human reason largely on the empirical side as an admitted power of knowing the positive and finite, we seek to learn how these two factors of knowledge have been adjusted to each other in the scale of the sciences and to show that adjustment to be strictly logical, or in accordance with the rational structure of the human mind, as well as worthy of the divine wisdom and goodness.

Here at the outset, and all through this investigation, we beg to emphasize the disclaimer of any intention to prejudge the essential relations of reason and revelation by determining *a priori* their respective limits, contents and prerogatives; in other words, any rash attempt to dictate beforehand what God must teach in His word or man must learn from His works. It is a purely *a posteriori*, inductive study which is

proposed. Taking the Scriptures as they are and the Sciences as we find them and simply freeing the former from the dogmas built upon them and the latter from the hypotheses mixed with them, we would penetrate to their actual connections as they will come into view on examination, wherever true science and pure Scripture are found intersecting each other and thus enclosing the same class of facts as a common field of interest and inquiry. And our method will be to give the result of such a strictly inductive investigation in the form of logical laws or canons which may be tested in their practical application to the existing state of knowledge, divine and human. The first of these canons, applicable throughout the series of sciences, may be thus stated :—

CANON I.

Reason and Revelation are Complemental Factors of Knowledge in each of the Sciences.

By this canon is meant, in the first place, that the two factors of knowledge are so correlated that each supplies what the other lacks or comes in where the other ceases. It belongs to the very notion of revelation that it should disclose what reason could not otherwise discover, and to the very notion of reason that it should not claim to discover what must be revealed. That would be no revelation, in any strict sense, which merely told us what we knew before or could have known without it, as that would be no right use of reason which would prejudge or reject what had been plainly proved to be the word of God. It will be seen that we are not now fixing any sharp boundaries between the two powers, but simply insisting upon the general principle that the discoverable and revealable limit each other by the very definition of the terms. If it be sometimes loosely said that the Scriptures reveal much rational truth, even the chief articles of natural religion, yet we are always careful to guard against so narrow a use of the word by speaking of revealed truth, especially the distinguishing doctrines of revealed religion, as not discoverable by reason.

In the second place, and more explicitly, it is meant that the two factors of knowledge require and support each other. As correlated, neither can do without the other. There could be no revelation without reason as the receptive organ of divine knowledge; and reason without revelation would be forever imperfect as the active instrument of human knowledge. On the one hand, revelation presupposes reason, offers both its evidences and its contents to reason, and would be simply impossible but for reason, since we may not even so much as imagine it addressed to an insensate stone, an unintelligent plant or an irrational animal. On the other hand, reason is intellectually as well as morally fallible until aided by revelation, everywhere reaches limits which it cannot pass except as guided by revelation, and at length confessedly loses itself in an infinite Unknowable which revelation alone could fully make known.

It is indeed conceivable, perhaps, that the two powers might have been otherwise proportioned and adjusted. For aught we can tell, we might have been endowed with an omniscient intuition, rendering revelation needless, or have been overwhelmed with one swift apocalypse, superseding the slow process of reason. But if there be any higher intelligences thus gifted and privileged, such are not the facts of our lower nature and condition. We have to do with a Scripture adapted to our limited reason as well as a science incomplete without revelation.

In the third place, it is meant that the two factors of knowledge taken together yield the *omne scibile*, whatsoever can be known in a given department of science. When we have blended all that man has discovered and all that God has revealed concerning any class of facts, we have as much light as can possibly be shed upon those facts; for then the human intelligence has been supplemented by the divine intelligence. If perfect knowledge respecting them is attainable, it must come from these two sources. Even angelic teachers, could they bring us further information or train us to higher researches, would themselves be but organs of the same infinite intellect which has communicated with our finite intellect through prophets and apostles; and it would still

be strictly true that our science is perfectible only by the joint process of reason and revelation.

With this brief exposition of the canon, we pass now to its practical proof in the sciences, again premising that we do not assume to fix the bounds which divide reason from revelation in any field of inquiry, to say precisely how much God should reveal or how much man could discover; but we merely aim to show that the truths actually revealed and discovered, be their relative proportions what they may be, greater or less, will be found logically essential to each other, and that on examination it will appear that what God has revealed, plainly ensues upon and complements what man has discovered in each of the sciences. To see this, we need only, in the roughest general way, ascertain the two complementary portions of knowledge, and then compare and combine them.

Let us begin the inquiry in the physical sciences, and with the first of them. In astronomy, on the empirical side, what has man discovered? A vast system of celestial physics extending through unbounded space and time, and including uncounted globes which move with tremendous forces through fixed orbits and periods, and mayhap with ever-changing climates and histories. And on the transcendental side what has God revealed? Just what was needed to complement these discoveries of the astronomer; that in the beginning God created the heavens, that wisdom was with Him when He prepared them, that by understanding hath He established them and garnished them by His Spirit, that they declare His power, and faithfulness and glory, and, moreover, that He is worshipped in the highest heavens by all the hosts of heaven, angels and archangels, excelling each other in strength and wisdom. Take away this revealed portion, and what would remain? A godless and soulless solitude throughout the universe; an omnipresent energy with no potential source; a tremendous mechanism without cause or purpose, life or reason; a vast crowd of evolving worlds whirling and crushing through the ages back to the chaos from which they sprang. Take away the discovered portion, and what would remain? That infinite Jehova of hosts, whom the heaven of heavens cannot contain, shrunken with all his illimitable

perfections into our little earthly firmament like an Olympian Jove with his idle thunders or an enthroned monarch amid his courtiers. But bring the two portions together, and at once they will coalesce in the consistent conception of a Creator of the heavens and earth, whose immensity, eternity, omnipotence, immutability and omniscience are expressed in the laws and movements of planets, suns and systems; whose angelic hierarchies may find in the celestial worlds their many mansions, and whose earthly theophany at least was ordained to the intent that now unto principalities and powers in heavenly places might be made known his manifold wisdom.

In geology, on the empirical side, what has man discovered? A complex system of terrestrial chemistry, involving the development of our globe, during vast eras, from a portion of the solar nebula, into a fiery nucleus, through successive strata, floras and faunas, to the living orders which now tenant its balanced seas and continents. And on the transcendental side, what has God revealed? Simply the due counterpart of these discoveries; that in six days the Lord made heaven and earth, the sea and all that in them is, plants, animals and man; and saw that all was very good; that on the seventh day He rested from His works and made it the type and pledge of a sabbath for man; that every rainbow betokens His covenant with the earth that seed time and harvest, summer and winter, day and night shall not cease; and that the whole earth is full of the riches of His wisdom and goodness. Take away this revealed portion and there would be left nought but a blind evolution of chaotic matter and force without rational cause or aim; successive dynasties of life supplanting one another in one long, fierce struggle for supremacy; and an issuing medley over the globe of chance and design, life and death, pain and pleasure. Take away the discovered portion, and that eternal Jehova, with whom a thousand years are but as one day, will appear crowding the creative energy of ages into a few hours merely to enforce a lesson of Sabbath observance, and then maintaining a rule throughout animate nature as impotent and malevolent as that of some all-devouring Saturn or tyrannical prince. But combine the two portions of knowledge, and the creative

epochs of Genesis become illustrated by the cosmogonic eras of geology in one growing argument for the power, wisdom and goodness of that Creator whose tender mercies are over all His works, and unto whom are they all known from the beginning of the world.

In anthropology, on the empirical side what has been discovered? A consummate system of human physiology, recapitulating in man the whole organic scale beneath him and exhibiting his varied races, languages and arts, through all shades of climate and in all degrees of culture. And on the transcendental side what has been revealed? All that will yet be needed to match these still imperfect researches; that when the earth was finished God made man after His own likeness, but a little lower than the angels, with dominion over the brutes, in a state of innocence; that after the fall from paradise and judgment of the deluge, Jehova confounded the speech of mankind at Babel, divided them into tribes and nations, scattered them over the earth, but still chose one of them to be set apart and trained for the salvation of every other kindred, people and tongue. Take away these revealed truths and civilized man could see in himself only a developed animal; his highest and purest culture would be accepted as but the gradual outcome of savage bestiality; and the image of God be lost in the image of an ape. Take away the discovered facts, and that marvellous frame, whose members were all written in God's book when as yet there was none of them, would seem to have been wrought as a mere Promethean statue of clay in the midst of living nature, and the divine wisdom and justice in the ordering of races and peoples throughout history become but the caprice of a despot. But unite the two fragments of knowledge, and man would stand forth as the embodied image of his Maker, the very microcosm and masterpiece of creation, and the ages of stone, bronze, and iron, of gold, silver, and brass, if traceable in his development, would but follow in the course of that Providence who hath made of one blood all nations of men to dwell on all the face of the earth, and hath determined the times before appointed and the bounds of their habitation.

Passing on and up into the less exact mental sciences, we

may trace everywhere the same logical connection between the two adjoining fields of research, with only more practical issues. In psychology, on the rational side, we find an approved theory of the mind as distinct from, yet implicate in the bodily organism, with its own peculiar phenomena and laws, its faculties of understanding, will and conscience and its instincts for truth, goodness and immortality; and on the revealed side, we have the complementary teachings,—that when God formed man out of the dust, He breathed into him a living soul; that that which is born of the flesh is flesh and that which is born of the spirit is spirit; that we are to be born again, renewed in the spirit of our mind, and to become new creatures in Christ Jesus, conformed to His image; that the body is to be kept under with all its members as instruments of righteousness; and that it will hereafter be raised from the dead and made like unto the glorious body of Christ according to the mighty working wherewith He can subdue all things unto Himself. Slight this set of truths, and the mind would be merged in the brain, right and wrong be viewed as mere balanced pain and pleasure, the will treated as but a fatal force, and all our noblest aspirations quenched at last in death. Slight the other set of truths, and that quickening Spirit who comes and goes like the gentle wind, will seem destroying in the act of renewing the soul as by some violent miracle, and the resurrection be depicted as a ghastly impossibility. But give due place to each set of truths, and we may think of the regenerate soul as growing in the grace and knowledge of Christ according to mental laws towards the new ideal manhood; and all that even the materialist can justly claim may be met by that glorified body which is yet to come as the flower blossoming from the seed, the butterfly metamorphosed from the worm, the dreamer awakening out of sleep. In sociology, on the rational side, we find the emerging theory of a social organism, whose members are concurrent individuals, with its distinct phenomena regulated by laws, its capacities for art, science and politics, and its progressive tendencies toward some ideal humanity; and on the revealed side we have the pertinent teachings,—that Christ as the second Adam is the

founder of a new spiritual race; that the church is his body of which we are members, a building of which he is the chief corner-stone, which is founded upon the apostles and prophets and in which we are set as lively stones; that He is head over all things to the church, and in it are yet to be gathered all nations with their glory and honor, when the kingdoms of this world shall become the kingdom of our Lord. Neglect these great truths, and the State will seem mere organized worldliness, science will run into nescience and unbelief, art will be prostituted to vice, and the most advanced civilization relapse to corruption and barbarism. Neglect the other great truths, and that glorious Church which is to be the salt of the earth and the light of the world, would become superstitious and worthless in the midst of surrounding culture, and the millenium itself be anticipated only as a social catastrophe. But bring the two bodies of truth into proper relations, and Christian civilization will then be seen advancing according to fixed social laws consistent at once with divine sovereignty and human freedom, and the philanthropist may join the prophet in looking forward to an era when art shall be resolved into worship, science be joined to faith, the state merged into the church, and the whole earth be filled with the glory of God.

Lastly, in theology, at the summit of the sciences, on the rational side, we are met by the new science of religions, with its asserted laws of religious development, its scale of myths, creeds and cults, and its speculative ideal of some ultimate essential faith of mankind; and on the revealed side we retain the momentous teachings,—that Jehova was revealed as the one true God and all the gods of the heathen as but idols; that God was manifest in the flesh, justified in the spirit, seen of angels, preached unto the gentiles, believed on in the world, received up into glory; and that the great incontrovertible mystery of godliness, is yet to be made known unto all men as partakers of the promises of Christ. Ignore these established verities, and all religion will be reduced to mythology, doctrines will be evaporated into abstractions, worship become mere decent usage and the most refined deism collapse in atheism and impiety. Ignore the new

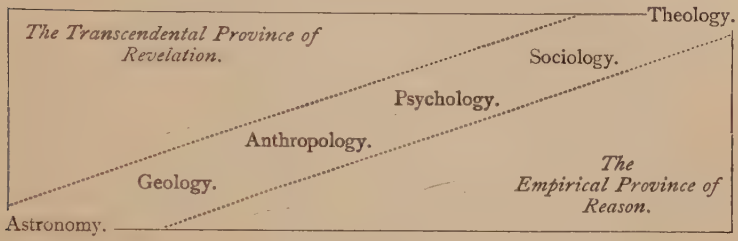
religious researches, and those great mysterious doctrines, which are to be preached and taught among all nations, will be simply unintelligible and fruitless in the face of heathen wisdom and learning, and the predicted triumph of the gospel of peace be imagined as naught but a vast vindictive judgment. But adjust rightly the rational to the revealed theology, and Christianity would go forth among the world's religions as at once transcending and including them, absorbing their truths and rejecting their errors, in the progress of civilization as well as in the course of Providence, and the philosopher no less than the saint, the heathen as well as the Christian, may hail in its message the one absolute faith which is worthy of all acceptation.

It has thus become apparent from a hurried survey of the sciences in their normal order, that their rational section without its revealed counterpart would be logically unsupported, leaving all the great transcendental problems of the phenomenal universe unsolved and ever insolvable; whilst their revealed section without its rational complement would be logically indefensible, lacking that empirical evidence without which the whole body of divine truth would become incredible, if not useless. Strike out the rational half of knowledge, and your apologetics would crumble into ruin. Strike out the revealed half, and you would cut philosophy in twain; but keep the two together as logically congruous, and you will at once promote true philosophy and vindicate essential Christianity.

Glancing backward now over the ground traversed, we shall see that the rational and the revealed portions of each science are by no means equal to one another in amount or importance and that the proportion between them varies in different sciences. This brings into view the next law or rule governing the adjustment of divine to human knowledge.

CANON II.

THE PROVINCE OF REVELATION EXPANDS AS THAT OF REASON CONTRACTS IN THE ASCENDING SCALE OF THE SCIENCES.



In order to test this canon, we need simply to ascend and descend from one science to another, comparing their respective contents in only the most superficial manner. Beginning on the transcendental side at the base of the scale, in astronomy, we find but little revealed matter, scarcely any data for the science; merely a Creator of the heavens, with His physical attributes as manifested in them, His immensity, eternity, omnipotence, but with nothing definite as to the physical mode of their production. Advancing into geology, we come upon a little more revealed matter than in astronomy, some valuable truths, such as the series of creations by which the earth was fitted for man, its moral adaptations as the scene of human probation, and its manifold illustrations of the divine power, wisdom and goodness, though with scarce a hint as to its physical formation. Rising into anthropology, we meet with still more revealed matter than in geology, some very important truths, such as the creation of man in the image of God, his vicegerent dominion over nature, his lapse from a state of innocence, the origin of races, languages and arts, and their primitive adjustment in a wise and just scheme of universal Providence, together with a few glimpses of their early history. The Scriptures plainly contain more about man than about the earth, as they contain more about the earth than about the heavens. Mounting next into psychology, we at once enter a sphere of revelation much larger than that occupied in any of the physical sciences and includ-

ing much more essential truths, such as the origin of the soul, its inherent sinfulness, its subjection to the moral law, its redemption from guilt, its regeneration by the Spirit, its growth in faith, hope and knowledge, its destined conformity to the new manhood of Christ, and its final perfection in a glorified body at the resurrection. A step higher, from psychology into sociology we find the scope of revelation including not merely the individual soul, but the whole human race with all its tribes and nations in one vast scheme of salvation, beginning at the primal apostasy, unfolding through thousands of years in the Jewish theocracy and the Christian Church, and at last to be consummated in a new regenerate humanity at the end of the world. Leaving sociology, we at length reach the summit in theology, and there, as on a sunlit peak to which we have climbed with an ever-widening horizon, we behold the field of revelation expanding towards infinity, until it comprehends the entire course of creation, providence and redemption, the mysteries of the trinity, incarnation and atonement, the destiny of saints and angels and the ever-unfolding glories of the Godhead. The Scriptures themselves thus make it clear that they are the one inspired text-book of divinity, at once surmounting and containing all the inferior sciences so far as connected with God and divine things.

But if we now turn away from these heights of revelation to descend the series on the empirical side we shall see the rule reversed as to the province of reason. At the first step downward, from the revealed into the rational theology, we are met by a science whose very title is disputed, whose theistic proofs are still discredited, whose consent of religions is not yet evolved, whose laws of their growth are but conjectured, and whose ideal faith could only be fulfilled by revealed religion itself. Descending into the rational sociology, we come upon a science with more approved claims, with a vast collection of historical phenomena, with proposed laws of human development, with economic and political theories, but also with speculative utopias which could only be realized by the Christian Church. Passing next into the rational psychology, we find an already recognized science,

with some ascertained laws of mental action, with well-defined faculties and feelings, with logical, æsthetical, ethical theories, but at the same time with a reasoned immortality to be confirmed only by the promised resurrection. The psychical sciences are thus seen to contain but little rational knowledge, with unsolved problems which are mainly transcendental and which revelation alone might solve, such as the destiny of the soul, of society, and of religion; but the physical sciences will be found to contain much more rational knowledge, with unsolved problems which are largely empirical and which reason may yet solve, such as the origin of the heavens, of the earth, and of man. Entering anthropology still on the rational side, we find the young sciences of ethnology, philology and archæology in the very region of Scripture history already retracing the evolution of species, languages and arts through well-described stages and epochs, whilst the living physiology presents more of strictly scientific knowledge than psychology. Coming next into geology, we can review the creative days of Genesis in the secular growth of strata, floras, and faunas, and in the whole terrestrial chemistry, organic and inorganic, we shall discover a mass of knowledge fast approaching scientific exactness. Arriving at last in astronomy near the confines of the biblical cosmogony, we may behold the very root, leaf and flower of worlds in evolving nebulæ, suns and planets; and in the celestial physics, molar and molecular, we can study a body of science which has been growing through thousands of years toward mathematical certitude, without light from revelation, as a pure product of reason. Astronomy thus viewed is at once the most perfect of the rational sciences and the least perfect of the revealed sciences, as we found theology at the summit of the scale to be the most perfect of the revealed sciences and the least perfect of the rational sciences; psychology being midway between these extremes with its rational and revealed contents more evenly balanced. In other words, the rule holds good that revelation expands as reason contracts in the ascending order of the sciences.

Now, in looking for some reasons of this canon, we do not forget the inductive principle upon which we have proceeded.

It is one thing to fix the limits of the divine word according to our own preconceptions; but another to discover, accept and vindicate the limits which God Himself has fixed according to His perfect wisdom. To argue *a priori* that the Bible should contain more or less of any topic—for example, more physiology or psychology, more about bodily diseases and their remedies, or more about the future life and its employments—would plainly be a trespass not less irrational than irreverent. Bishop Butler has clearly shown, from the analogy of natural science, that we are in no sense competent judges of what kind and degree of supernatural instruction should be afforded us in a revelation. Nevertheless, having once accepted the Scriptures as duly inspired, should we find therein more psychology than astronomy and more theology than either, we may then endeavor to show that such a divine apportionment of revealed knowledge is fit and reasonable, or, as before stated, in accordance with the pre-existing structure of the human mind, as well as worthy of the divine wisdom and goodness.

The first most obvious reason why revelation increases in the ascending order of the sciences may be found in the fact, that their human importance increases in the same order. Not necessarily their divine importance, nor even, if we may so speak, their angelic importance. Within the view of God there may be higher interests in the universe than those of our race, and in a revelation made to angels our earth might have less prominence than some other worlds; but in the revelation actually given to mankind we find the heavens presented mainly in their relations to the earth, the earth chiefly in its adaptations to man, man's lower physical nature in subordination to his higher spiritual nature, the individual man as an organic member of society, and all other social concerns as tributary to the one chief concern of religion. And this order of subjects clearly befits our position and relations in the creation. For us men, speaking generally, there is nothing great in the heavens but the earth;

> "On earth there is nothing great but man;
> In man there is nothing great but mind;"

and before all minds, simple or combined, there is nothing

great but God. By so much as the divine transcends the human, and the spiritual is superior to the material, by so much does it seem important that more should have been revealed to us in the psychical than in the physical realms of inquiry. Had the proportion been reversed, as in Hindoo theosophy and Greek philosophy, the Bible might long since have been overlaid with grotesque cosmogonies and vain speculations. But the scale of divine revelations has been so adjusted to the scale of human interests that the sciences unfolding in due order become like a series of valuable caskets one within another, enclosing at last the priceless pearl of divinity, or a succession of mystic chambers opening one after another into the holy of holies, the very shekina of the revealed Godhead.

A second less obvious but more cogent cause why revelation increases in the ascending order of the sciences may be found in the fact that the sufficiency of reason decreases in the same order. This indeed would simply follow as a corollary of our first canon respecting the complementary office of Scripture, if it can now be shown that we are constitutionally less competent in the higher than in the lower realms of cognition; and as we proceed through them, such a growing incompetency will appear at every step, in the very structure and furniture of the human intellect. In physical science, we rely mainly upon observation, together with simple notions of space, time and force; in chemical science chiefly upon experiment, together with subtle notions of atomic affinity and property; in organical science, largely upon comparison of organs and functions, with crude notions of life and final cause; in mental science, upon mere consciousness, with its store of complex thoughts, emotions, volitions; in social science, upon partial history, with its medley of events, institutions, records; in religious science, upon vague tradition, with its tangled web of facts and fables, defying analysis. And close upon this decreasing competency of unaided reason comes revelation supplementing heathen tradition with inspired Scripture, profane history with sacred annals, ordinary consciousness with spiritual knowledge; whilst in the lower sciences, where our natural means of research are so

much more abundant and accurate, the supply of supernatural light and guidance goes on proportionately diminishing. Suppose the contrary were the case, if it be supposable, and the Bible as a text-book of physical revelations, might have debarred the spiritual progress of mankind, and reduced human knowledge at length to mere animal sagacity. But in the Scriptures as we have them, the Divine Intellect appears adapting itself to the human intellect at every succeeding stage where it needs more assistance, with new increments of truth and knowledge, until reason at length pales in the full blaze of revelation, and the seriate sciences, as thus illumined, have become like

> "altar stairs
> That slope through darkness up to God."

A still more conclusive reason for such a graduated revelation may be seen in its fitness to the phenomenal order of human knowledge. What may be the transcendental order of the divine knowledge or even of angelic knowledge, it were simply useless to inquire; but what is actually the order of our knowledge, as predetermined by the order of phenomena, can be learned from the history of the sciences, as well as from their logical connection. It will be found that in nature, and therefore in our logic, the mechanical precedes the chemical; the chemical, the organical; the organical, the spiritual; the individual, the social; and the social the religious; and that this succession of phenomena, for us at least, is never broken or reversed. It will also be found that the physical group of sciences is largely empirical, embracing facts which have long since accumulated, such as pertain to the past development and present condition of the heavens, of the earth, and of man; whilst the psychical group of sciences is chiefly transcendental, embracing facts which are still accumulating, such as pertain to the present condition and future development of the soul, of society and of religion. And to this pre-existing order of facts we can now see that revelation has been adapted, or at least is adaptable. With this order, indeed, corresponds even the historical succession of the Scriptures and in the main their canonical arrangement from Genesis to Revelation, the Old Testament

chiefly supplementing the physical sciences, at their empirical limits, whilst the New Testament more largely complements the psychical sciences with transcendental communications of divine wisdom. Could we imagine this order reversed, revelation would be seen interfering with reason in its own sphere, whilst reason would be left impotent in the sphere of revelation, and the doubt of the agnostic, as well as the scoff of the infidel, might be justified. But throughout the Scriptures as now coördinated with the sciences, the author of nature becomes manifested as also the author of revelation, the Creator himself appears as the revealer, respecting not less his intelligent creatures than his own pre-ordained creation.

Without stopping to show the apologetic worth of this argument, we pass at once to a philosophical deduction more germane to our present purpose. It has been becoming evident from our study of the complemental relations of Scripture and science, that revelation was not designed to supersede reason in its own normal function, or to do for it what it can do for itself, but only to guard, to cleanse and to guide it, to supply its due exigency, to carry the torch before it into regions otherwise unknowable, to feed it with new truths and problems, and thus to enlarge its vision and field of inquiry. This opens the way for a third and last canon of Christian knowledge.

CANON III.

THE RECIPROCAL ACTION OF REASON AND REVELATION THROUGHOUT THE SCIENCES INVOLVES THE INDEFINITE EXPANSION OF HUMAN SCIENCE TOWARDS DIVINE OMNISCIENCE.

Here again we need carefully to recur to our inductive procedure. The design of the Scriptures can be learned only from the Scriptures themselves, from their actual contents and from their legitimate effects. We may have honestly accepted them as divine, and yet be applying to them some false foregone theory of their aims and uses. We may even have drawn from them their most essential doctrines, and still be narrowing their scope and purport within our

own dogmatic interpretation. To say, as some divines from the most pious motives have said, that the Bible was not designed to teach any science but theology and has nothing to do with philosophy, may turn out to be a mere masked form of rationalistic prejudgment. The Bible was simply designed to teach whatever on due examination it is found to teach, and to produce all the good effects which it is seen experimentally producing. It no more presents its theological material in a scientific form than its psychological or ethical material. Although theology is its chief topic, yet it has immensely promoted all other interests of civilization; and it can be shown that it has a philosophical value in the realm of science, besides its higher value in the sphere of religion. This should simply be welcomed as a fresh proof of its excellence, instead of being denounced as a mere profane admixture of divine and human knowledge. We ought not, indeed, to go to the length of the first great Christian philosopher, Clement of Alexandria, in holding a perfected philosophy to be the last and highest aim of Christianity, but surely we can at least include such philosophy among its incidental effects and trophies. And in this guarded sense we here speak of an ultimate or ideal omniscience as the goal of Christian science.

Perhaps we need to be warned against still another misconception. Modern philosophy has run to extremes alike wild and perilous; on the one side, to the studied nescience of Hamilton, Mansel and Herbert Spencer; and on the other side, to the fancied omniscience of Fichte, Schelling and Hegel; the former despairing of the world-problem as a paradox of reason, and the latter transcending even revelation with its imagined solution. In shunning the one extreme, let us not fly to the other. Even prophets and apostles were not inspired with perfect science. The Scriptures do not at once efface human ignorance. With all their aid we cannot expect to seize the whole absolute truth at a glance by sheer intuition or to overtake infinite knowledge at a bound by mere speculation. Nevertheless, we may look forward to such knowledge as the prize of an endless career, and pursue such truth with unquenchable faith and hope.

By thus projecting Christian science as an ever knowing of the ever knowable we free it at once from the Spencerian agnosticism which would resolve it back into absurdities, and from the Hegelian gnosticism which would evaporate it into abstractions.

With this definition of the canon before us, we might now descend to the metaphysical relations of reason and revelation, and argue the perfectibility of Christian knowledge from the indefinite capacity of the former as an organ of science, and from the exhaustless resources of the latter as a communication of omniscience. It might be shown that the finite intelligence co-acting with the Infinite Intelligence throughout endless fields of inquiry could never reach, though it might ever approach, a point where the curiosity of the one and the mystery of the other had been at last exhausted. But as such an argument might seem to assume *a priori* an ever-unfolding revelation, as well as an ever-expanding reason, it will be more in keeping with our inductive method to gather proof from the extant products of the two factors as seen in the history of the sciences up to the present stage of their development, and as affording probable if not certain provision of their future progress.

In the first place, the action of revelation upon reason throughout the sciences has already completed their ideal fields of research, to whatever extent they may now be projected. Before the dawn of science and in its early stages, it might have been said, as indeed it has been said, that it was destined to outgrow Scripture and supersede it by opening beyond it new regions of truth which would be wholly unknown to it, and for which its omniscient Author had made no provision; but during nearly two thousand years of intellectual progress it has been meeting each succeeding advance with the same ever-needed complementary truths and doctrines. To the whole existing mass of empirical knowledge it still affords the logical support of a transcendental wisdom without which all science itself must plunge into confessed absurdity and nescience. Although astronomy now embraces a practical infinitude of space, teeming with countless worlds, yet as a field of research, in the view of philosophy at least,

it would still be incomplete without the metaphysical theory of a revealed Creator of the heavens and earth, and it is safe to say that without that theory it would ever remain incomplete, though it should push its researches still farther into sidereal realms as yet even beyond the reach even of a conjecture. Geology, in like manner, though it should yet include a practical infinitude of time, and seek to trace the development of the earth from chaos to cosmos and from cosmos to chaos again, would ever need for its philosophical completion the creative epochs of Genesis and Revelation. Anthropology also, though it might aim to unfold, with the growing and decaying globe, the growth and decay of all human arts, languages and races, would always require the providential economies revealed in the Scriptures for its own rational support and consistency. The psychical sciences still more obviously and philosophically demand to be complemented in all conceivable stages of their progress with the revealed doctrines concerning the origin and destiny of the soul, of society and of religion. In a word, the Old and New Testament Scriptures will be found to have been projected as with an omniscient view of the whole possible future as well as of the whole actual past of human science.

In the second place, the reaction of reason upon revelation throughout the sciences, besides ever strengthening the evidence of the Scriptures, has been steadily enlarging their philosophic scope and purport. Not only has the infidel scientist often been an unwitting and sometimes an unwilling witness to their essential verity, but in the issue of every conflict with its phenomenal language the Christian scientist has returned to interpret that language, as he has learned to interpret the phenomena themselves, in a richer sense and with a wider application. Their unsophisticated descriptions of the divine attributes as manifested in the whole visible creation, and all their spiritual communications on the metaphysical side of philosophy, have been growing infinitely more significant and comprehensive, as fast as the field of empirical science has expanded. How different the astronomical psalms as once read by the Hebrew peasant looking up to a spangled vault and as since read by a Newton or a Herschel,

gazing into an immensity brilliant with myriads of stars and planets! What a change in Genesis as interpreted by the church fathers who saw in the earth a mere sea-girt plain and crystal dome which had been fabricated in six working days, and as since interpreted by a Hugh Miller or a Guyot, tracing the developed globe through all its successive eras and wonderful phases as the finished home of humanity. Why need we fear, if even the Adam of the Biblical anthropology, so long fancied as a mere clay image modelled by his maker, should be found to be a divine ideal unfolding through the geologic ages and the historic epochs as the very flower of the cosmic life? And do not the various Scriptures which treat of the new man, the church and the millennium, contain riches of truth which the moralist, the reformer and the divine have only begun to estimate? Would it be strange if the New Testament, as well as the Old, should hereafter receive scientific proof and enlargement? if psychology should yet foreshadow the spiritual body as physiology has been unfolding the natural body? if sociology should yet forecast the Apocalypse as geology has been revising Genesis? if theology should yet take within its scope the whole spiritual family of heaven and earth, as astronomy is already embracing the many mansions of the Heavenly Father? Hitherto it would seem to have been one mission of science to aid in correcting and perfecting the exegesis and application of Scripture, and judging the future by the past we may expect to see the expanding capacity of reason still fed from the inexhaustible content of revelation.

In the third place, the reciprocal action of reason and revelation in the sciences now helps us to project their hypothetical completion through the cycles of an endless progress. It is indeed but a general corollary of the three preceding axioms, that in proportion as God reveals and man discovers the truth pertaining to every class of facts, will we know more and more in a ceaseless course of knowledge. Imagine, what as yet can only be imagined, a completed action of reason and revelation in every field of research; imagine astronomy completed in both its rational and revealed sections, until we should have a perfect knowledge of the origin, structure, and

destiny of planets, suns and galaxies; imagine geology in both its rational and revealed sections completed until we should have a perfect knowledge of the origin, structure and destiny of the globe we inhabit; imagine anthropology thus completed until we should have a perfect knowledge of the earthly origin and destiny of mankind; in a word, imagine all the sciences thus completed in their due order one after another, until we should have a perfect knowledge of the whole existing creation, and even then there would still remain the revealing Creator himself, capable of unfolding new creations with new creatures forever and ever. Not even in thought could we fix the goal of Christian knowledge, though we should take a flight through all worlds and ages, but would only see it still beyond us receding farther and farther and growing brighter and brighter until human science would seem to vanish in divine omniscience as a star dies into the dawn.

The votary of true wisdom will be as much chastened as exalted by these high thoughts. He cannot forget how largely knowledge is conditioned by faith, docility and reverence, without which the loftiest intellect must falter in its career and upon which must it depend, whether like Raphael it shall scale the empyrean of truth, or fall like Lucifer never to rise again.

In closing the discussion there is need for a word as to its logical use and importance. It will be seen that we have been treating of the ideal or normal relations of reason and revelation rather than of their existing abnormal relations; of true Science as distinguished from the theories and hypotheses which are often mixed with it and mistaken for it, and of pure Scripture as separate from the doctrines and dogmas which have been built upon it, some indeed as gold, silver, and precious stones, but others as mere wood, hay, and stubble. In practice it is not easy to make this discrimination. It would be strange if some traces of hypothetical and dogmatic prepossessions had not been noticed in the previous argument, though not enough, it is hoped, to interfere with its drift and general conclusions. A more practical and more immediately useful class of canons would be such as could be

applied to the conflicting hypotheses and dogmas which in our day have so seriously disturbed the harmony of science and religion, and such a set of logical rules is yet to be offered in a later stage of this investigation. But it is plain that before we can profitably study the existing abnormal relations of reason and revelation we must first have gained, if possible, some general conception at least of their normal relations, of what pure reason would be if rightly exercised and of what pure revelation would be as rightly interpreted. And we therefore add one or two considerations as to the utility of the axioms which have been presented.

The first is, that by means of such axioms we may greatly narrow the field of controversy and clear it from the start of much debatable matter. Many a dispute might have been prevented, had the disputants simply observed the obvious truth that all is not rational that pretends to be rational and all is not revealed that offers itself as revealed. Nothing is more common than for the religionist to set up some mere dogma in place of the Bible and clothe it, bare human teaching though it be, with all the authority of revelation; and because his scientific antagonist, who may be as sincere and devout a believer in the Bible as himself, has unwittingly run against that dogma, he is charged with irreverence and summarily ruled out of the debate as an infidel. And on the other hand, quite as often do we see the scientist commit a like error by setting up some mere hypothesis in place of true science, and demanding for it all that implicit faith which we yield to unquestioned facts or proved theories, and because his religious antagonist, who may be as earnest a lover of science as himself, and as anxious to see it prosper, still consistently holds his ground against that hypothesis, he is denounced as a bigot and ignominiously put beyond the pale of philosophy. But we may at least preclude so extreme issues and sweeping controversies by insisting at the outset upon some fixed rules of reasoning and securing assent to all that is axiomatic or sufficiently proved, and therefore logically obligatory upon both parties.

The other consideration is, that besides thus narrowing the field of debate, we shall reveal a much larger basis of agree-

ment. It will be found that the consensus of the schools, like that of the sects, is more essential than their dissensus; the real concord of science and religion greater than their seeming discord. The canons above presented, though so fundamental and comprehensive in their scope, are much more readily proved, accepted and applied, than any canons that can be devised for the provisional adjustment of scientific hypotheses and religious dogmas. To some minds they may seem to be little more than truisms, too obvious to be discussed. The majority of divines and naturalists can and do agree already in accepting the evidence of true science as well as the authority of pure Scripture, much as they may differ as to the dogmas derived from the one and the hypotheses broached in the name of the other. And if, therefore, we will go behind the clouds of conceit, passion and prejudice which obscure them from view, we shall find them massed together on a broad, common ground of all but axiomatic truths and principles such as we have been considering. Instead of perpetually tearing up the foundations and building them over again, we shall be able to accept something as settled by the wisdom of ages and consent of nations, and continue to erect thereon the temple of truth and knowledge. Instead of ever returning upon our own track in vicious circles of controversy, we shall keep the ground we have fairly won and advance from it to new conquests. Instead of staking the whole common truth of science and religion upon every new hypothesis or stale dogma that comes in dispute, we shall fall back upon that great essential mass of knowledge, divine and human, which has lived and grown through all sects and schools and which is likely to outlast even the caprices and fashions of our own time.

INDEX OF SUBJECTS

IN THE ORDER OF THEIR TREATMENT.

INTRODUCTION.

THE AIM AND SCOPE OF PHILOSOPHY.

Definition of philosophy, 3, 4: its problems, 4, 5: method of their solution, 6, 7, 8: aims of philosophy, as a science, as an art, as a science of the arts, 8, 9, 10: scope of philosophy, 10, 11, 12: its benefits, 12, 13, 14: its pleasures, 15, 16, 17: sanctions of philosophy, 19, 20: the philosophic virtues, 21, 22, 23: the religious graces, 24, 25, 26: The vision of perfect knowledge, 26–28.

PART I.—PHILOSOPHY AS THE SCIENCE OF THE SCIENCES.

CHAPTER I.

THE PURIFICATION OF THE SCIENCES.

Conception of a science of the sciences, 31: need of their purification, 32: history of their purification, 33.

Sources of Error in the Sciences, 34-41: *Idola* of Bacon, 34–36: past growth of science, 37, 38: prospects of science, 39-41.

Definition of the Sciences, 41–52: exact, verified, organized knowledge, 42, 43: high qualities of pure science, 43–45: its utility, social production and unity, 46–48: sciences as distinguished from letters, from the disciplinal studies, from the arts, and from philosophy, 48–51: relative worth of the sciences and arts, 51, 52.

Classification of the Sciences, 52–79. Difficulties and advantages of their classification, 53, 54: its history, 56: Greek and Roman classification, 55, 56: scholastic classification, 57, 58: reformed classification, 59: spurious classifications, 60, 61: philosophical classifications: (1) Subjective, 61: Baconian classification, 62: German, 63, 64: Whewell's, 65, 66: Italian, 67: (2) Objective classifications: Scottish, 68, 69: French, 70–72: Comtean, 73–75: Herbert Spencer's, 76, 77: defects of all mere classification, 78.

Philosophical Scheme of the Sciences, 79–112: Real sciences, 80: Fundamental sciences, 81: Physical and psychical sciences, 82: Place of theology, 83: six groups of fundamental sciences, 84: celestial and terrestrial divisions, 85, 86:

celestial biology and ethics, 87, 88: serial order of sciences, 89: serial psychical sciences, 90: inter-dependence of the series, 91–93: development of celestial sciences, 94. This order of the sciences is historical, logical and practical, 95–98: principal sciences, 98: a working classification, 98: distinction between empirical and metaphysical science, 99: claims of metaphysic science, 100: agnostic theories of science, 101: relativity of knowledge, 102: covert metaphysics of Spencer, 103: revival of metaphysics in England and among physicists in Germany, 104, 105: meeting of scientific with speculative metaphysicians, 105: metaphysics of physical and mental sciences, 106: metaphysical and empirical sections of each science, 107: their correlations as perceived by eminent scientists, 108: importance of their correlation, 109; tabular view of the two provinces, 109. Importance of a supreme science of the sciences, 109. Scientific conception of such a science, 110: growth of this science, 111: its chief topics and divisions, 112.

Conditions of a Science of the Sciences, 112–127. 1st condition, all the sciences must have come into being, 112: mistakes of Comte and Fichte, 112: 2d condition, it must include all the contents of all the sciences, 113: metaphysical as well as empirical, 114: Comte's law of scientific evolution as amended, 115: agnostic theory of Fiske, 115, 116: 3d condition, it should include all the legitimate factors of knowledge, 116: anti-metaphysical logic of Comte, Mill and Lewes, 117, 118: the problem of revelation a strictly philosophical question, 118, 119: the Logic of Science compared with the logic of Christian evidence, 119, reason and revelation as complementary factors of knowledge in the sciences, 120: tabular view of philosophy as embracing the empirical and metaphysical provinces of the sciences, 120: 4th condition, it should include revealed religion as the metaphysical complement of the sciences, 121: the law of the complete development of the sciences, 121: metaphysic and divinity, 121: Relation of philosophy to religion in natural, in apologetic, and in dogmatic theology, 122, 123: relation of religion to philosophy, as the science of things divine and human, as the science of the absolute, as the science of the sciences, 125, 126. Summary of results, 127.

CHAPTER II.

Survey of the Sciences.

Sciences to be surveyed in both their empirical and metaphysical sections. History of sciences and history of dogmas. Three historic stages since the Reformation. Tabular view, 128–130. Classification to be used, 130.

SURVEY OF ASTRONOMY.

Rational Astronomy.—First stage of healthful separation from a false biblical astronomy: progress of the science: leading authorities: establishment of solar and sidereal astronomy, 130–132.

Hypothetical astronomy. Opposite hypotheses as to the origin, development and destiny of worlds. Hypothesis of a spontaneous growth of the suns and planets from nebulæ: its history and chief advocates: extension of it to the stars and galaxies. Hypothesis of a series of worlds: its history and principal advocates, 132–135. Hypothesis of a plurality of inhabited worlds: its history, principal advocates and opponents, 135–139. Rival hypotheses of a final chaos or permanent cosmos, with their respective adherents, 139–141.

Universal evolution, 141. Review of empirical astronomy, 142.

Revealed Astronomy.—First stage of healthful separation from a false scientific astronomy. Leading divines and reformers who freed the Scriptures from the superstitions of the mediæval astrology and divination. Establishment of a true biblical astronomy, 142, 143.

Remaining traditional dogmas as to the creation, angels, and the predicted new heavens. Opinions of the principal fathers, schoolmen, reformers and later divines, 143–148.

SURVEY OF GEOLOGY.

Rational Geology.—Discovery of the true figure, surface and strata of the globe: chief founders and authorities of the science, 149–152. Opposite views of leading Neptunists and Vulcanists as to the formation of the earth; of the principal Catastrophists and Uniformitarians as to the development of the globe; and also as to the durability or approaching destruction of our planet, 142–163.

Revealed Geology.—Deliverance from false scientific geologies and cosmogonies. Prominent schoolmen, reformers and divines who have thus aided in establishing the true biblical geology, 163, 164. Oriental, Greek, Patristic, Scholastic and Prostestant opinions as to the primitive chaos: Dogmas of the same authorities in respect to the creative days or periods: and also in respect to the predicted new earth, 165–169. Review of geology as rational and revealed, 170. Geological hypotheses and dogmas, 170.

SURVEY OF ANTHROPOLOGY.

Rational Anthropology.—Discovery of the true physical structure and rank of man. Origin and progress of physiology, ethnology, philology and archæology, with chief authorities in the anthropological sciences, 170–172. History of controversies in regard to the evolution or the constancy of human races, languages and arts, and contrasted views of leading physiologists, linguists and antiquarians. Similar history of controversies and collation of opinions as to a unity or a plurality of races, languages and arts; and also as to a gradual improvement or extinction of the same, 173–196.

Revealed Anthropology.—Deliverance from the traditional scientific anthropology—Modern reformers, divines, missionaries who have made contributions to ethnology, philology and archæology, and thus founded a true biblical anthropology, 196–198. Pagan, Hebrew, and Christian traditions, ancient, mediæval, and modern Church dogmas, concerning the original divine image in Adam: similar traditions and dogmas, as to the fall of mankind in Adam: and also, as to the new race in Christ, the Second Adam of the new covenant, 198–204. Anthropological dogmas and hypotheses, 196, 204.

SURVEY OF PSYCHOLOGY.

Rational Psychology.—General character of hypotheses and dogmas in the psychical sciences, 204. Emancipation of medical psychology from mediæval superstition: rise of logic, ethics and æsthetics: leading thinkers who have classified the mental faculties and law, and defined and founded the scientific psychology, 205–207. Opposite schools of spiritualists and materialists, who have resolved matter into mind, or mind into matter: of necessitarians and libertarians, who have maintained the slavery or the freedom of the will: of mortalists and immortalists, who have advocated the destruction or the survival of the soul, 207–224.

Revealed Psychology.—Disappearance of the scholastic psychology under the theological criticism of the reformers: prominent divines who have made contributions to ethical and logical science, and treated psychologically of the doctrines of grace, 224–225. Creationism and Traducianism as held by leading Catholic and Protestant divines, who have taught that the soul is immediately created by God or derived from the parents: similar authorities who have maintained a baptismal or a moral regeneration of the soul: various traditional dogmas as to the resurrection, purgatory and paradise, 225–229.

SURVEY OF SOCIOLOGY.

Rational Sociology.—Emancipation of the State from a false theocracy, and rise of the political and social sciences: leading statesmen, historians, publicists, economists, philanthropists who laid the foundations of a scientific sociology, 230–232. Opposite views of prominent legitimists and revolutionists who have traced civil government to a divine right or a social contract: philosophic historians who have pragmatically referred all civilization to Divine Providence, to kings and statesmen, to great men, to great ideas: or who have inductively sought laws of physical, intellectual, moral, and providential development in art, science, politics and religion: rival schools of re-actionists and progressionists who have advocated the corruptibility of human society or maintained its indefinite physical, intellectual and moral improvement, 232–253. Review of rational sociology, 254.

Revealed Sociology.—Emancipation of the Church from the tyrannical forms of the State, and growth of purer views of its spiritual nature and mission: ecclesiastical martyrs and reformers who have re-organized Christian society and redefined the Scripture doctrine of the Church, 255, 256. Still remaining Catholic, Episcopalian, Presbyterian and Congregational dogmas of Church polity: Catholic, Protestant, Sectarian and Schismatic schools of Church history: various views of the Church triumphant or Church of the future, 256–258. Sociological hypotheses and dogmas, 258.

SURVEY OF THEOLOGY.

Rational Theology.—Decline of scholastic divinity and rise of natural theology: Deists and speculative Theists who have framed the moral, teleological, cosmological, ontological proofs of a God, and missionaries, antiquarians and mythologists who have been seeking to found a new scientific theology or science of religions, 259, 260. Supernaturalistic Theists who have maintained that religion is wholly revealed and traced natural religion to the Christian revelation, and both to a primitive revelation: Rationalistic Deists who have maintained that religion is purely rational, reduced Christianity to mere natural religion, and merged both in other religions of the heathen world: Theists who have referred the history of religion to successive divine economies involving the destruction of heathenism, Judaism, and corrupt forms of Christianity: Deists who have referred the history of religion to laws of political, intellectual and religious development, susceptible of scientific study and treatment: Christian theists who have been anticipating the triumph of Christianity over Heathenism, Mohammedanism and Antichristian heresy, as the one absolute religion of the future: Comparative religionists who anticipate the one absolute religion from a coalescence of Christianity with other religions, 260–283. New school of scientific religionists; its problems and literature, 284, 285.

Revealed Theology.—Emancipation from patristic and scholastic dogmatism—

Protestant Reformed and Puritan divines who have aided in restoring the true revealed doctrine of God and divine things, 285, 286. Catholic, Protestant, Reformed, Puritan and Sectarian dogmatists who still adhere in various degrees to the traditional theology, 286, 287. Philosophy of religion, as compared with the empirical science of religions, 288,–291. Review of theology, and of the sciences, 292, 293.

CHAPTER III.

The Science of the Sciences.

Three divisions of the Universal Science, with three corresponding problems; the philosophic, the metaphysic, the theosophic, 294, 295.

Philosophic Science.—Definition, 296. History of its rational and revealed provinces, 296–326. Legitimate rise of free thought at the Reformation: leading philosophers who have announced and constructed new theories and systems of universal knowledge and thus contributed material for an ultimate philosophy or Science of the Sciences, 296–298.

(I.) Theory of rational knowledge, 298–324. *Realism and Idealism.* Idealists who have restricted all knowledge to divine ideas, or to mere phenomena, or to self-consciousness; Realists, who have embraced in our knowledge material objects, external qualities and noumenal essences. *Transcendentalism and Empiricism.*—Transcendentalists who have proceeded deductively from the divine attributes, from self-consciousness, from the absolute idea; Empiricists who have proceeded inductively from mere phenomena, to their causes, to their laws. *Absolutism and Positivism.*—Absolutists who have held the Infinite to be conceivable, cognizable, and comprehensible; Positivists who have held it to be incomprehensible, incognizable and inconceivable, 298–320. Comparison of realism and idealism, empiricism and transcendentalism in the history of the sciences, 321, 322. Their combination in the sciences; relations of nomology, etiology and ontology or theology, 322. Law of scientific development from theology through teleology to nomology, and thence through teleology back to theology, 323, 324.

(II.) Doctrine of revealed knowledge, 324–329. Reaction against the false Protestantism of free thought and rationalism, 324. Christian apologetes and philosophers who have contributed materials and formed evidential schools for definitely settling the doctrine of revealed knowledge, 324.

Catholic and Protestant dogmas as to the inspiration, the canon, and the fulfilment of Holy Scripture as a source of divine knowledge, 324–327.

Philosophic theory of knowledge, as involving a theory of revelation in the special sciences, in the science of the sciences, and in metaphysic science, 327, 329; Problem of theism, 330.

Metaphysic Science.—Definition; its rational and revealed provinces, 330.

(I.) Theory of absolute being.—Decline of scholastic subtleties before modern metaphysic thought; leading founders of metaphysical psychology, cosmology, and theology, and their present votaries, 330, 331.

Monism and Dualism.—Opposite schools of thought as to the origin of existence, 332–337. History of dualism, 332; dualists advocating dynanism and vitalism in the physical sciences; spiritualism and idealism in the psychical sciences, and theism in ontology, 332–334. History of monism, 335; monists

advocating atomism in the physical sciences; spiritualistic and materialistic monism in the psychical sciences; and atheism and pantheism in ontology, 336. Recent German, French, English and American speculations, 337, 338.

Evolutionism and Creationism.—Rival schools as to the development of the universe, 339–343. History of creationism, 339; creationists in the physical and psychical sciences, 339. History and authorities of evolutionism, 340; atheistic evolutionism, 341. Battle of creationism and evolutionism in Germany, England and America, 341–343.

Optimism and Pessimism.—Origin of optimism, 343; theological, metaphysical, apologetic optimism, 343–345. History of pessimism, 345; German metaphysical pessimism, 346. Literature of modern optimism and pessimism, 347, 348.

Comparison of rival metaphysic schools, 348–350. Elements of truth in creationism; in evolutionism; combined view, 349, 350. Extreme errors of optimism and pessimism; combined truths in meliorism, 350, 351.

(II.) Doctrine of revealed being.—Deliverance from the metaphysical divinity of the middle ages; reformers and speculative divines who have laid the foundation of a new metaphysical theology at once rational and revealed, 351, 352. Catholic and Protestant dogmas, concerning the trinity, the creation, and redemption, 352, 353.

Review of metaphysic science. The rational and revealed metaphysic agree in a theistic theory of the world, as consistent with the process of cognition, as logically conceivable, as scientifically probable, and as ensuring the intelligibility of the universe, 354–357.

Theosophic Science.—Abuse of the term theosophic; definition as here used; its philosophical significance, 357, 358. History of relations of science and religion; in the pre-christian age; in the patristic age; in the scholastic age; in the reforming age; present critical relations; emerging theosophic problems, 358–360.

Naturalism and Super-naturalism.—Two rival schools as to the form of revelation. History of supernaturalism; German mysticism, French quietism, English Methodism, American revivalism, 361, 362. History of naturalism; English, French and German Deism; modern naturalism, 362–364. Forms of combined mysticism and orthodoxy; of combined orthodoxy and deism, in different countries, 364–366. Extreme errors of naturalism and supernaturalism; scriptural illustration, 366–368. Religious view of revelation as wholly supernatural; scientific view of revelation as wholly natural; philosophic view of revelation as simply transcendental, 368–370; Immaterial whether such a revelation is miraculous or not; intellectual need of it; rational capacity for it; its wonderful adaptation to the human reason, 370–372.

Rationalism and Super-rationalism.—Two rival schools as to the content of revelation. History of super-rationalism since the Reformation, 372; its modern phases, biblical infallibilism, ecclesiastical infallibilism, papal infallibilism, 374–377. Growth of rationalism out of mysticism, 377; its successive stages, critical, exegetical, dogmatic, philosophic, 377–382. Modified views of papal infallibilism, of ecclesiastical super-rationalism, of biblical super-rationalism, 382–384: English modifications of the Protestant theory of inspiration; American opinions, 384–386. Comparison of extreme errors of rationalism and super-rationalism, 387; their combined truths, 388. No presumption against the reasonableness of a

revelation that its human organs are fallible; or its contents mysterious and even paradoxical; necessity for reasonableness of a revelation: actual reasonableness of its contents; adaptation of its problems to human reason; progressive reconciliation of revealed with rational knowledge, 388–391.

Agnosticism and Gnosticism.—Two rival schools as to the relations of revelation with science. Rise of the agnostic tendency, 391; its successive phases as deferential, critical, sceptical toward revealed knowledge, 392, 393. History of the gnostic tendency since the reformation; its efforts to harmonize and combine rational with revealed knowledge, 393–395. Gnostic and Agnostic parties in current philosophy; Catholic gnostic philosophy; Protestant gnostic philosophy, in England and in America, 395–398. Agnostic party; their authorities and opinions, 398–400. Intermediate opinions in the agnostic religion, ethics, philosophy; the academic question, 401–403. Comparison of extreme errors of agnosticism and gnosticism; Their combined truths, 403, 404. Rational knowledge accordant with revealed; revealed accordant with rational; both rest on like evidence; either complemental of the other; together they tend to complete knowledge, 404–406.

Complete Theory of the Sciences.—Combined solution of the problems of knowing, of being, and of revelation; resulting theory of perfectible science; the theory applied in the sciences; its foundations, in the cognitive capacity as illimitable; in the universe as infinitely knowable; in the divine omniscience, 406–409. Connection of such a theory of the sciences with the art or logic of the sciences, 406–410.

PART II. PHILOSOPHY AS THE ART OR LOGIC OF THE SCIENCES.

CHAPTER I.

The Logic of the Empirical Sciences.

Definitions: Universal Logic; Formal Logic; Applied Logic; Chief divisions of Logic of the Sciences. Topics waived for the present. English, French and German authorities in Empirical Logic, 413–415.

CHAPTER II.

The Logic of the Metaphysical Sciences.

Problems of metaphysical logic: deductive logic of sophists, schoolmen, and modern divines; inductive logic as applied to religious problems by Butler; tentative works on such logic; apologetical logic a desideratum; relation of apologetics to philosophy; its true value in the science of the sciences, 415–419.

Evidences of Theism.—The *a priori* proofs; the ontological, cosmological, and psychological. The *a posteriori* proofs; the teleological, the moral and the historical. Practically we should proceed from the latter to the former, 420–421.

Evidences of Natural Theology.—Theistic arguments and illustrations of divine power, wisdom and goodness from astronomy, from geology, from anthropology: leading authors who have elaborated such arguments, 421–426.

Evidences of Natural Religion.—Theistic arguments and illustrations of

divine wisdom, goodness and justice afforded by psychology and sociology, with principal authors who have elaborated such proofs and illustrations, 426–428.

Evidences of Revealed Religion.—Reasonableness of Christianity as distinguished from all natural religions, 428; its successive conflicts with Judaism, Paganism, Philosophy, Barbarism, Mohammedanism, Rationalism, Modern Heathenism, 428–432. Classification of Christian evidences as External, Internal and Mixed, with subdivisions, 432–434. The two evidential schools, one exalting miracle, the other exalting doctrine; their real harmony, 434, 435. Continued increase of the evidences; the scientific evidences a new class, peculiar to our age, 435, 436. Organized efforts to promote them, and rich, growing literature, 437.

CHAPTER III.

The Logic of the Science of Sciences.

Three classes of canons of philosophical logic. Premises assumed, the validity of reason and revelation; the serial order of the sciences; the distinction between the empirical and metaphysical regions of cognition; Tabular view, 438–441.

Canon I. Reason and Revelation complemental in each science: each supplies what the other lacks; they support each other; together they yield the sum of the knowable in each science, 441–443. This canon ascertained inductively, a posteriori. Proofs of it in astronomy, in geology, in anthropology, in psychology, in sociology, in theology, 443–448.

Canon II. Revelation expanding, reason contracting in the ascending order of the sciences: tabular view: comparison of content of the sciences; more rational material in astronomy, geology and anthropology; but more revealed material in psychology, sociology and theology; while the two equal in physico-psychology, 449–451. Inductive proofs of this canon: the human importance of the sciences increases in their ascending order; the intellectual need of revelation increases in the same order; such a graduated revelation is required by the logic of the sciences, 451–455. Apologetic and philosophic value of this canon, 455.

Canon III. Revelation and Reason acting together involve the perfectibility of science. Danger of prejudging revelation either by making it ignore all science, or by surcharging it with omniscience, 455–457. This canon founded in the relations of finite and infinite intelligence: revelation proves to be the metaphysical complement of the sciences; the sciences have unfolded wonderfully the meaning of revelation; the sciences may be hypothetically completed on the assumed interaction of reason and revelation as functions of human and divine intelligence, 457–460. Logical use and importance of these canons; they greatly narrow the field of conflict between science and religion, and exhibit their ever-growing harmony amid all transient discords, 460–462.

INDEX OF AUTHORS

WHOSE OPINIONS HAVE BEEN CITED.

Abbot, Francis Ellingwood, 306, 313, 398.
Abelard, 202, 230, 404.
Abrahams, Rabbi, 385.
Achillini, 171.
Ackerman, 264.
Acosta, 189.
Adams, 235.
Adelung, 171, 172, 182, 191.
Adhémar, 162.
Agassiz, Prof., 153, 171, 179, 186, 187, 189, 197, 339.
Akenside, 426.
Albert of Bollstadt, 163, 168, 310, 317.
Albertius, 57.
Albertus, 259.
Albo, 424.
Alcott, 313.
Alcuin, 57.
Aldrovandus, 171.
Alembert, D', 15, 62, 297, 312, 318.
Alexander, Stephen, 140, 325.
Alford, 383.
Alger, 223.
Alison, 206, 238.
Alliacus, Cardinal, 163.
Alviella, D', 290.
Amaury, 270, 335.
Amberley, 290.
Ambrose, 144, 165, 202.
Ammon, 394.
Ampère, Andrè, 71, 72.
Anaxagoras, 332.
Andrea, John Valentine, 365.
Angelo, Michael, 229.
Anselm, 202, 259, 261, 317, 404.
Apollodorus, 198.
Apollonius, 266.
Aquinas, St. Thomas, 17, 22, 57, 143, 145, 147, 168, 196, 200, 202, 207, 212, 219, 226, 227, 228, 234, 241, 259, 260, 261, 317, 339.
Arago, 132, 136, 140.
Arduino, 151.
Argyll, Duke of, 181, 195, 417.
Aristophanes, 165.
Aristotle, 13, 17, 21, 33, 35, 37, 55, 70, 80, 99, 214, 222, 224, 297, 330, 358, 391, 393.
Arius, 353.
Arminius, 216.
Armistead, 191.
Arnauld, 202, 300.
Arndt, 361.
Arnobius, 222.
Arnold, Edwin, 283.
Arnold, Matthew, 250, 258, 289, 342, 346, 364, 365, 383, 384.
Arnold, of Brescia, 230.
Arnold, of Villanova, 274.
Arnot, Neil, 59.
Assall, 185.
Athanasius, 167, 199, 260.
Athenagoras, 430.
Atwell, W. E., 385.
Audæus, 199.
Augustine, St., 56, 143, 144 147, 152, 167, 177, 185, 199, 200, 201, 202, 205, 207, 212, 219, 226, 227, 228, 241, 259, 278, 310, 317, 339, 358, 369.
Ayala, 230.

Babbage, Charles, 161, 423.
Bachman, 183.
Bacon, Lord, 14, 17, 22, 33, 36, 37, 39, 40, 44, 46, 52, 59, 61, 63, 65, 68, 72, 99, 107, 124, 205, 231, 243, 248, 251, 252, 297, 298, 302, 310, 312, 318, 330, 388, 392.
Bacon, Roger, 58, 110, 163, 274, 278, 296, 297.
Bagehot, 246.
Bahnsen, 309, 345.
Bahrdt, 346.
Bain, 75, 207, 215.
Bakunin, 237.

Baldassari, 151.
Balfour, Arthur J., 401, 418.
Balguy, 426.
Ballantyne, 289.
Balmes, Prof., 377.
Balzac, 212.
Bannerman, Dr., 374.
Barclay, Robert, 362.
Barclay, Wm., 234.
Barker, 211.
Barnes, 325, 417.
Baronius, Cardinal Cæsar, 257.
Barot, Odysse, 243.
Barrat, 313.
Barrow, 185.
Barzellotti, Prof., 101.
Basedow, 364.
Basil, 144, 147, 165, 228.
Bastian, 340.
Baudin, 187, 194.
Bauer, 380.
Baumgarten, 63, 206, 260.
Baur, 264, 269, 382.
Baxter, Andrew, 208, 220, 303.
Bayle, 233, 363, 394.
Beal, 289.
Beale, Lionel, 333.
Beale, Rev. Samuel, 263.
Beaumont, Elie de, 156.
Beckett, 402.
Bede the Venerable, 57, 166.
Beecher, 218.
Beechey, 185.
Bell, Sir Charles, 170, 425.
Bellarmin, 145, 200, 215, 232, 233, 234, 256, 376.
Belsham, 214.
Beneke, 209, 298, 304, 330.
Bengel, 365.
Bentham, Jeremy, 80.
Bentley, 135, 223, 324, 421.
Berengar, 170.
Berkeley, Bishop, 99, 164, 197, 209, 225, 297, 300, 303, 306, 324, 325, 334, 336, 392, 394.
Bernard, 200, 247, 337.
Berthes, 333.
Berthold, 200.
Bessarion, 296.
Bessel, 132.
Beza, 202, 226.
Bichat, 333.
Bickersteth, 272.
Bielfield, Baron, 62.
Bilfinger, 260.
Binet, 337.
Birks, Prof., 367.
Bithel, 399, 401.
Blanc, Louis, 236.
Blasche, 223, 344.
Bledsoe, 218.
Bleek, 192.
Blount, Sir Charles, 267, 363, 365.
Blumenbach, 171, 179, 182, 186, 197.
Boccaccio, 149, 266.
Bodin, John, 230, 242, 243, 247.
Boehme, 314, 340, 361, 362, 377, 395.
Bold, 210, 223.
Bolingbroke, 217, 363.
Boethius, 57.
Bonar, 272.
Bonaventura, 57, 227, 229.
Boniface, 278.
Bonnet, Charles, 210, 213, 223.
Bopp, 172, 195, 197.
Bordeau, M., 78.
Borey, 187.
Borreby, 180.
Bosanquet, 313.
Boscovich, 333, 340.
Bossuet, 145, 233, 237, 257, 271, 275, 339, 361, 382.
Boucher, de Perthes, 176.
Boulainvilliers, 242.
Boullanger, 241, 274.
Bourignon, 361.
Bowen, 313.
Bowne, 313.
Boyle, 311.
Bradford, 184.
Bradley, 313.
Brander, 151.
Brentain, 207.
Bretschneider, 394.
Briggs, 386.
Brissot, 236.
Brocchi, 193.
Bromley, 362.
Bronginart, Adolphe, 151.
Brougham, 417.
Broughton, 223.
Brown, 187, 215, 218, 312, 313.
Bruno, 132, 392.
Buchanan, Dr., 417.
Buchanan, George, 234.
Buchez, 231, 241, 275, 339.
Buchner, 190, 224, 335, 337, 340.
Buckland, 423.
Buckle, 188, 341, 243.
Buddens, 352.
Buffier, 304.
Buffon, 154, 157, 160, 171, 185, 186, 312, 333.
Bunsen, 172, 184, 195.
Burke, 206.
Burmeister, 187.
Burnet, 155, 157, 163, 164, 173.
Burnouf, Emilé M., 82, 124, 267, 277.
Burthogge, 208, 300.
Busolt, 337.
Butler, 17, 22, 85, 122, 123, 197, 388.

Butler, Bishop, 221, 225, 244, 253, 260, 262, 275, 324, 325, 344, 352, 365, 369, 426, 427.
Byron, 346.

Cabanis, 211.
Cabell, 183.
Cabet, 236, 251.
Cæsalpin, 171.
Caird, Prof., 292, 306, 397.
Cairns, 385.
Calderwood, David, 257, 298, 315, 338, 396.
Calvin, 142, 144, 148, 166, 168, 197, 201, 202, 212, 226, 256, 318, 373.
Campanella, 58, 110, 209, 230, 251, 274, 275, 278, 297, 310, 343, 391.
Campbell, 288, 325, 426.
Campee, 179.
Cantoni, Carlo, 69.
Capella, Martianas, 56.
Cardan, 274.
Carey, 192, 252.
Carlyle, 238.
Carpenter, 183.
Carrière, Mauritz, 337.
Cartwright, Thomas, 255.
Carus, Dr. Paul, 338.
Case, 313.
Cassiodorus, 57.
Catherine, Empress, 191.
Catlin, 184.
Celsus, 167, 265, 269, 273.
Chalmers, 87, 123, 143, 164, 225, 256, 262, 335, 386, 417, 426, 427.
Chalybäus, 306, 334.
Chambers, Dr., 386.
Champollion, 172, 180.
Channing, 267.
Chapman, 262.
Charlemagne, 57, 194, 278.
Charpentier, 153.
Charron, 233, 318, 392.
Chateaubriand, 248.
Christol, 172.
Chrysostom, 165, 199, 201, 232, 250.
Chubb, 363.
Cicero, 56, 122, 134, 194, 219, 234, 248, 250, 266.
Clairvault, 131, 140.
Clark, J. F.,
Clark, Wm., 179, 342.
Clarke, Henry J., 397, 425.
Clarke, Sam., 123, 217, 220, 223, 260, 339, 352.
Clayton, Bishop, 164.
Clement of Alex., 143, 261, 358, 404.
Clement of Rome, 147, 199, 201, 226, 292, 343.
Clifford, 337.
Cobbe, Miss Frances Power, 282, 401.
Cocker, 338.
Colenzo, 379.
Coleridge, 64, 68, 153, 218, 305.
Collard, 304.
Collier, 220, 299, 394.
Collins, 210, 214, 217, 223, 259, 267, 324, 363.
Colonna, Fabio, 150, 152.
Columbus, 149, 163, 184.
Comenius, 60, 361.
Comte, Auguste, 36, 54, 58, 68, 72, 73, 74, 75, 76, 78, 82, 88, 99, 100, 101, 108, 110, 111, 113, 114, 115, 117, 124, 129, 231, 243, 244, 245, 275, 281, 298, 312, 319, 320, 393, 399.
Condorcet, 96, 231, 244, 248, 252, 275.
Confucius, 268, 387.
Condillac, Abbé, 63, 210, 211, 302.
Cooke, 107.
Cooke, Josiah, 418, 423.
Cooley, 191.
Cooper, 206.
Conradi, 395.
Considerant, 251.
Constantine, 358.
Conti, Prof., 70.
Conybeare, Bishop, 262, 365.
Cope, 172, 340, 341.
Copernicus, 118, 131, 142, 297, 310.
Cordier, 159.
Corleo, Simone, 70.
Cournot, 72, 337.
Cousin, 218, 238, 239, 260, 298, 317, 344, 402.
Coward, 210, 223.
Crawford, 63, 191.
Crawfurd, M., 188, 252.
Croft, Herbert, 164.
Croley, 325.
Croll, 162.
Crousaz, 300.
Crusius, 216, 260.
Cudworth, 123, 208, 216, 217, 263, 324, 352, 365, 394.
Culbertson, 289.
Cumberland, 235.
Cumming, 273.
Curtiss, G. Ticknor, 342.
Cusa, 131.
Cuvier, 129, 150, 151, 153, 156, 171, 174, 178, 182, 185, 197, 311, 312, 339.

Dalembert, 61.
Dalton, 333.
Daniell, 154.
Dante, 57, 145, 229.
Darwin, Charles, 175, 178, 179, 190, 206, 214, 246, 313, 340, 342.

Darwin, Erasmus, 215.
Daub, Karl, 395.
Daubeny, 153, 159.
Davids, 289.
Davies, Sir John, 207.
Davis, 185.
Davy, Sir Humphrey, 136, 152, 159, 160.
Dawson, 152, 180, 424.
De Bonald, 248.
De Broglie, 289.
De Candolle, 186, 194.
De Gama, 149.
De la Rive, 154.
De Mailing, 173.
De Maistre, 248, 376.
De Thou, 231.
De Tocqueville, 230.
De Vere, Mr. Aubrey, 342.
De Vinci, 149.
De Wette, 269, 364, 379, 380.
Delitzsch, 225.
Demarest, 151.
Democritus, 132, 209, 335, 340.
Derham, 143, 260, 421.
Descartes, 59, 70, 124, 132, 133, 205, 208, 210, 219, 248, 259, 299, 302, 307, 310, 314, 318, 330, 334, 339, 394.
Desmoulins, 187.
Dewey, 267.
Dickey, 424.
Diderot, 214, 302, 363.
Dieffenbach, 185.
Dietrich, 313.
Digby, Sir Kenelm, 208.
Diman, 396.
Dinant, 335.
Dike, 417.
Diodorus, 260.
Doddridge, 384.
Dods, 289.
Dodwell, 210, 223.
Döllinger, 289, 382.
Donati, Vitalian, 151.
Dorner, 129, 265.
Douglas, 289.
Dove, Patrick Edward, 69, 231, 244.
Draper, 243, 250, 341, 399.
Drayson, 162.
Drobisch, 414.
Drossbach, 223.
Drummond, 343.
Dühring, 414.
Dupaix, 189.
Duprius, 267.

Eberhard, 186.
Ebrard, 325, 431.
Eckhart, 314.
Edelman, 364.
Edkins, 289.
Edwards, Jonathan, 144, 214, 217, 225, 271, 339, 344.
Eichhorn, 364, 379, 380, 381.
Eliot, 195.
Ellis, 184.
Emerson, 16, 239, 313.
Emmons, 214, 374.
Emory, 417.
Empedocles, 332, 346.
Epicurus, 209, 210, 215, 222, 335.
Epiphanius, 241, 250.
Erasmus, 206, 212, 214, 215, 266.
Erdmannn, 70.
Erigena, John, 335.
Ernesti, 378, 379.
Escobar, 216.
Euler, 131.
Euripides, 264.
Eusebius, 237.
Eustachius, 171.
Ewald, 384.

Fairbairn, 272, 291, 313.
Fallopius, 171.
Faraday, 104.
Farrar, 385.
Fechner, 105, 305.
Felix, Minucius, 261.
Fénélon, 361.
Ferguson, James, 180, 242, 247.
Ferrarese, 61.
Ferrari, 239.
Ferrier, 298, 315, 354, 396.
Feuerbach, Ludwig, 224, 270, 291, 336, 337.
Fichte, 16, 36, 64, 110, 112, 113, 209, 218, 221, 239, 260, 269, 276, 283, 291, 298, 301, 304, 308, 329, 345, 381.
Fichte, J. Hermann, 306, 334, 352, 396.
Ficino, Marsilio, 219, 296.
Figuier, Louis, 176, 193, 221.
Filmer, 233, 235.
Finney, 218.
Fischer, 414.
Fisher, 325.
Fiske, Prof. John, 74, 76, 77, 78, 93, 101, 103, 115, 313, 342, 393.
Flacius, Mathias, 257.
Flammarion, M., 137, 193.
Fleming, 164, 194, 208.
Fleury, 257.
Flint, Prof., 55, 70, 111, 240, 292, 338, 396.
Florus, 241.
Flourens, 183.
Fontenelle, 137.
Forbes, Prof., 186, 197.

Fourier, 159, 161, 236, 244, 245, 249, 251, 252.
Fowler, 414.
Fowne, 423.
Fox, George, 362.
Fracastoro, 149.
Frank, Sebastian, 361, 377.
Frankland, 337.
Franzelin, 396.
Fraser, 298.
Frauenstädt, 218.
Frazer, 306.
Frère, Abbé, 172, 242, 244, 249.
Frohschammer, Prof., 320.
Froude, 240.

Gabler, 364, 365, 380.
Gale, Theophilus, 262.
Galen, 169, 170, 185.
Galileo, 131, 132, 134, 137, 297, 310.
Gall, Dr., 211.
Galliain, 189.
Galton, Francis, 191.
Gaschel, 221.
Gassen, 374.
Gassendi, 132, 210, 224, 335, 340.
Geikie, 152.
Generelli, 157, 163.
Gentilis, 230.
George, 414.
George, Henry, 236.
Gerhard, 147, 226, 365, 373.
Gerson, Chancellor, 255.
Gesner, 149, 151, 171.
Gibbon, 231, 238, 247.
Gibbons, Cardinal, 382.
Gioberti, 306, 344.
Gill, Dr., 168.
Giovanni, D., 67.
Gladstone, 265, 417.
Glass, 272.
Gliddon, 186, 188.
Glisson, 208.
Gobinean, Count, 181, 187, 189, 194.
Goclenius, 206.
Godwin, 214, 248, 255, 402.
Goethe, 220, 340, 346.
Gonne, 320.
Gonzalez, 216.
Graham, 399.
Gratiolet, 172.
Green, 298, 306.
Greenleaf, 325.
Greg, 124, 249, 283.
Greg, Percy, 401.
Gregoire, 191.
Gregory of Nazianzum, 144, 228.
Gregory of Nyssa, 199, 225.
Gregory the Great, 145, 227, 229.
Grimm, 192, 195.
Griffith, 397.
Grote, 231.
Grotius, Hugo, 230, 231, 235, 248.
Grove, 104, 139, 340.
Guelinex, 213.
Guizot, 230, 231, 242, 243, 252.
Günther, 334.
Guthrie, 320, 401.
Gutzlaff, 279.
Guyon, Madame, 361, 365.
Guyot, 152, 153, 339, 423.

Haeckel, 105, 175, 179, 185, 246, 313, 337, 340.
Hagenbach, 129.
Hales, Alexander, 199.
Hall, 183.
Hallam, 173, 231.
Halley, 139, 140, 160.
Halsten, 291.
Halyburton, Dr., 261.
Hamilton, Alexander, 235.
Hamilton, Sir Wm., 13, 69, 102, 207, 260, 303, 315, 319, 320, 392, 393.
Hardwick, 263, 279.
Harms, 105.
Harper, Father, 396.
Harrington, 230, 250.
Harris, 313, 338, 398.
Harrison, 320, 399.
Hartley, 206, 210, 214, 217.
Hartman, 108, 218, 283, 309, 317, 320, 345, 346.
Harvey, 171.
Hase, 129.
Hazard, 218.
Heckwelder, 198.
Hegel, 36, 66, 80, 100, 124, 206, 221, 240, 269, 283, 291, 298, 306, 309, 317, 329, 330, 334, 337, 344, 346, 381, 395.
Helmholtz, 139, 340, 402.
Helmont, 314.
Helvetius, 302.
Hengstein, 272.
Henry, 46, 97.
Henslow, 342.
Heraclitus, 36.
Herbart, 215, 209, 245, 298, 304, 305, 330, 334.
Herbert, 122, 220, 259, 261, 266, 267, 363, 365.
Herbert, Prof. Martin, 338.
Hercules, 267.
Herder, 231, 240, 245, 246, 341, 380.
Hermann, Prof., 246.
Herschel, Sir John, 107, 131, 134, 135, 136, 138, 155, 158, 161, 162 333, 339.

Herschel, Sir Wm., 131, 133, 134, 135, 136, 138, 162.
Herthing, 337.
Hervas, 197.
Hesiod, 198.
Heylin, 233, 257.
Heyn, 222.
Hickok, Janet, 207, 298.
Hierocles, 266, 267.
Higginson, 282, 290.
Hilaire, Geoffrey St., 157, 174, 312.
Hilaire, Isidore, St., 72.
Hill, President, 61, 424.
Hipparchus, 161.
Hitchcock, 164, 423.
Hobbes, 44, 68, 206, 210, 213, 217, 235, 318, 324, 363, 378, 392.
Hockstetter, 194.
Hodge, 123, 129, 225.
Hodge, Archibald, 374, 386.
Hodge, Charles, 374, 383, 386, 396.
Hodgson, James, 400.
Hodgson, Richard, 399.
Hodgson, Shadworth, 295, 298, 320, 329, 354, 402.
Holberg, 160.
Hollazins, 166, 200, 226, 373.
Holtbach, D., 214, 223, 318, 335, 363.
Holwell, 267.
Homer, 264, 265.
Hooke, Robert, 150, 153, 154, 155, 159.
Hooker, Dr., 174, 175, 235, 384.
Hopkins, 161, 214.
Horace, 173, 247.
Hoslam, 263.
Huc, 184, 263, 279.
Huggins, 132.
Hugh, of St. Victor, 143, 166, 168, 199, 226, 228, 241, 260.
Humboldt, Alexander, 54, 58, 129, 133, 155, 156, 159, 160, 163, 172, 183, 188, 194, 197.
Humboldt, Wm., 72, 80, 183.
Hume, 82, 99, 124, 206, 208, 238, 275, 392, 393.
Hunt, 187.
Hunter, 170.
Husche, 336.
Hutcheson, 206.
Hutton, James, 154, 157, 303, 312, 363.
Huxley, Prof., 74, 104, 175, 212, 336, 341, 393, 397, 399, 400.
Huyghens, Christian,
Hyacinth, Père, 382.

Ignatius, 270.
Irenæus, 199, 358.
Irving, 273, 362.
Isidore, 57.
Iverach, Rev. J., 397.
Jackson, Mr. J. W., 191, 193.
Jacquinot, 185.
Janet, M., 101, 298, 337.
Janet, Paul, 313.
Jansen, 202, 212.
Jefferson, 235.
Jenyns, 433.
Jerome, St., 150, 225, 228.
Jevons, Prof. Stanley, 119, 249, 313, 402, 404.
Joachim, 270.
John of Parma, 270.
Johnson, Samuel, 173, 283, 290.
Jones, Joel, 272.
Jones, Sir William, 172, 279.
Jouffroy, 207, 218.
Julian, 266.
Justin, Martyr, 17, 123, 201, 222, 225, 228, 260, 261, 292, 299, 358.
Just, St., 236.
Juvenal, 198.

Kaimes, 206.
Kames, 197.
Kane, E. K., 194.
Kane, T. L., 194.
Kant, 61, 63, 64, 78, 99, 111, 124, 133, 206, 208, 218, 220, 244, 260, 269, 276, 291, 297, 301, 308, 314, 318 330, 333, 346, 381, 392, 394, 399.
Keil, Dr. John, 163.
Keith, 271, 325, 432.
Kennedy, 187, 194, 249.
Kepler, 16, 42, 131, 133, 137, 297, 310.
Kingsley, 238.
Kirchoff, 132.
Kidd, 422.
Kirby, 424.
Klaproth, 189.
Klentgen, Father, 377, 396.
Knox, 187, 194, 256.
Köppen, 291.
Krause, 316.
Krauth, 129, 298, 306, 334.
Kreig, 191.
Krug, 61, 276, 381, 394.
Kuenen, 342, 364, 379.

Labadie, John de, 362.
Labanca, Baldassare, 70.
Lacepède, Count, 178.
Lactantius, 137, 185, 222, 225, 270, 317, 332, 343, 358.
Ladd, Dr., 386.
La Forge, Louis de, 213.

La Grange, 131.
La Mettrie, 214, 223, 236, 363.
La Motte, 318.
La Place, 131, 133, 135, 140, 155, 161, 322.
La Ramee, Pierre, 297.
Lamarck, 157, 173, 178, 340.
Lamb, Charles, 194.
Lambert, 133.
Lamont, Prof., 135.
Laprune, M., 396.
Lang, 184.
Lange, 108, 216, 384.
Lardner, Dr., 136.
Lardner, N., 325.
Latham, 172, 183, 195.
Lavater, 211.
Law, Wm., 362.
Lawrence, 171, 179, 183.
Layard, 172.
Layola, 216.
Lazarus, Prof., 246.
Leade, Jane, 362.
Leathes, 385.
Lee, 384.
Legge, 289.
Lehmaur, 151.
Leibnitz, 132, 133, 154, 159, 171, 191, 206, 208, 213, 216, 219, 246, 297, 305, 314, 330, 333, 339, 344, 346, 352, 394
Leidy, 172.
Leland, 262.
Leonard, 374.
Leonardo da Vinci, 170, 310.
Leopardi, 346.
Le Plougeon, Dr. Augustus, 189.
Lepsius, 172, 191, 195.
Leroux, Pierre, 245, 275, 281.
Lessing, 13, 220, 231, 245, 267, 276, 364, 381.
Levassuer, 171.
Lewes, Mr., 75, 82, 87, 104, 117, 215, 298, 319, 393.
Lewis, Taylor, 264.
Linnæus, 171, 178, 182, 186.
Littlejohn, Bishop, 397.
Littre, M., 75, 298, 341.
Livingstone, 172.
Locke, John, 63, 206, 208, 210, 213, 235, 269, 300, 302, 318, 336, 392, 393, 394.
Lombard, Peter, 145, 166, 168, 200, 226, 227, 228.
Lord, 374.
Lotze, 207, 209, 215, 245, 291, 298, 305, 330, 334, 396.
Louis IV, 233.
Lowde, 208.
Lowth, 271, 384.
Lubbock, 177, 181, 267.
Lubker, 264.
Lucian, 137.
Lucretius, 132, 209, 225, 335, 340.
Luken, 263.
Lully, Raymond, 274, 278, 310.
Lundy, 289.
Luthardt, 325.
Luther, 59, 142, 148, 200, 202, 212, 215, 224, 226, 255, 256, 266, 318, 378, 384.
Lyell, Sir Charles, 129, 154, 158, 162, 177, 180, 185, 190.
Lyttleton, 325.

Mably, 235, 236.
Mackintosh, 215, 218.
Macknight, 272.
Maclaren, 192.
McClatchi, 279.
McCosh, 207, 303, 306, 338, 343, 424.
McIlvaine, 325.
McNeile, 272.
McTaggart, 320.
Machiavelli, 82, 235, 241, 247.
MacIntosh, 417.
Madler, 135.
Magellan, 149, 184.
Magnen, J. Chrysostom, 209.
Mahan, 335.
Mahomet, 389.
Maine de Biran, 218.
Malcolm, 417.
Malebranche, 13, 123, 144, 225, 297, 299, 318, 344, 394.
Malthus, 192, 196, 248, 249, 252.
Mandeville, 217.
Manicani, 306, 344.
Manichæns, 165.
Manlove, 228.
Manly, 374.
Manning, 376.
Mansel, 102, 123, 319, 320, 434.
Mantell, Dr., 154.
Marcet, 154.
Marheinecke, 352, 384, 395.
Mariani, 232.
Marsh, 172, 272.
Marsh, Prof., 192.
Marsigli, Count, 151.
Martensen, Dr., 375.
Martin, 179.
Martineau, 335, 338, 400.
Martyn, 289.
Martyr, Peter, 166.
Marx, Carl, 237.
Mary, John St., 234.
Matheson, 397.
Maudsley, 194, 206, 207, 211, 215, 336.
Maupertuis, 311, 312, 318.

Maurice, F. D., 135, 268, 277, 383.
Maury, 188.
Maxwell, Clerk, 333, 339, 402.
Mayer. 141, 340.
Meade, Bishop, 264.
Mede, 271.
Meigs, 187.
Meier, G. F., 219, 260.
Melancthon, 144, 202, 212, 224, 318.
Melito, 199.
Mendelssohn, Moses, 220, 260.
Mentone, 180.
Meyer, 129.
Michaelis, 379, 381.
Michelet, 223.
Michelet, M., 240.
Michell, Rev. John, 164.
Migne, Abbé, 437.
Mill, James, 214, 215.
Mill, John Stuart, 75, 77, 82, 84, 86, 101, 104, 117, 298, 312, 393.
Miller, Hugh, 181.
Miller, Josiah, 417.
Milner, Joseph, 258, 375.
Milton, 146, 235, 307.
Minucius, 261.
Mirabeau, 211, 236.
Mirandola, Count, 207.
Mitchel, Ormsby, 417.
Mitchell, 159.
Mitchell, S. W., 194.
Mivart, 342.
Moffat, 172, 198.
Moffat, J. C., 264, 277.
Möhler, 376, 383.
Moleschott, 224, 335.
Molière, 52, 176.
Molinos, 361, 365.
Momcrie, Prof., 401.
Mommsen, 184, 231.
Monboddo, Lord, 173, 340.
Mondino of Bologna, 169, 170.
Montaigne, 205, 209, 233, 259, 297, 318, 392.
Montesquieu, 193, 230, 242, 243, 247.
More, Henry, 208, 216, 220, 352, 394.
More, Sir Thomas, 230, 247, 250, 251, 365.
Morell, 129, 384.
Morelli, 235.
Morgan, 220, 260, 262, 267, 324, 363.
Mormon, 288, 389.
Moro, Lazaro, 157.
Morris, 263, 398.
Morrison, 198.
Morse, 46.
Morton, 171, 187.
Müller, Julius, 183.
Müller, Prof. Max, 83, 124, 172, 180, 184, 191, 195, 277, 282, 290, 399.
Myers, 385.
Nagelsbach, 264.
Nassau, Wm., 235.
Naudin, 193, 337.
Neal, Daniel, 257.
Neander, 273, 325, 384, 431
Necker, 179.
Nevin, 383.
Newman, 375, 377, 383.
Newmann, 279.
Newton, 32, 42, 44, 99, 107, 118, 131, 135, 139, 140, 150, 163, 210, 310, 311, 312, 325, 332, 339.
Nicholas of Cusa, 130, 142.
Nicole, 300.
Niebuhr, 184, 231.
Nillson, 172.
Niphus, 219.
Nitzsch, 276, 381, 384.
Nizolio, 58.
Noire, Ludwig, 337.
Nordhoff, 251.
Norris, John, 208, 222, 299, 394.
Norton, 325.
Nott, Dr., 186, 188, 194, 249.
Novanticus, Scotus, 338.
Nye, 255.

Occam, 318.
Ocellus, 241.
Oersted, 136.
Oken, 80.
Olhausen, 223, 272.
Olsen, Dr. W. W., 387.
Olver, Prof., 374.
Orbigny, D., 151.
Origen, 147, 167, 173, 199, 225, 228, 299, 358.
Ovid, 159, 198, 247.
Owen, John, 183, 236.
Owen, Prof., 136, 172, 174.

Paley, 325, 424.
Palgrave, 280.
Palissy, 150.
Pallas, 151.
Palmer, 256.
Pamphilion, 61.
Paracelsus, 186, 296, 314, 333, 393.
Paravey, 184.
Park, Roswell, 61.
Parker, Theodore, 124, 268, 282, 364.
Parmenides, 314, 315, 335.
Pascal, 26, 202, 212, 220, 233, 253.
Pastel, 270.
Patritius, 391.
Patton, 343, 374, 386.
Paulus, 364, 380, 381.
Peccanini, Melchior, 63.
Pelagius, 202, 215, 227.

Penn, Wm., 251, 362.
Pennant, 186.
Perrault, 252.
Perrin, Raymond S., 399.
Perronet, 210, 223.
Peterborough, Bishop of, 397.
Peters, Dr., 320.
Peyere, 197.
Peyretti, 67.
Pfaff, 138.
Pfannerus, Tobias, 266.
Pfeide, 291.
Phillips, 151, 281.
Phillips, Wendell, 195.
Philo, 167, 199.
Pickering, 172, 183.
Pico, 58, 393.
Pictet, 151, 172, 179.
Pinkerton, 184.
Plato, 13, 17, 36, 55, 134, 158, 169, 185, 219, 220, 234, 241, 247, 250, 261, 264, 266, 299, 330, 343, 358, 391.
Playfair, 129.
Pletho, 296.
Pliny the Elder, 56, 171.
Pliny the Younger, 153, 159.
Plumacher, 320.
Plutarch, 137.
Poiret, 361.
Poisson, 141, 162.
Politanus, 58.
Polo, Marco, 149.
Polycarp, 232.
Poole, Matthew, 164.
Pomponatius, 209, 219, 222, 274, 392.
Poppig, 194.
Pordage, 362.
Porphyry, 263, 269, 273.
Porta, John Baptist, 149.
Porter, 207, 298.
Pott, Prof., 188.
Pouchet, 129, 185, 187, 194.
Pouillet, M., 161.
Prescott, 184.
Pressense, 337.
Prevost, 304.
Price, 217.
Prichard, 172, 179, 182, 191.
Prideaux, 237, 271.
Priestly, 214, 217, 223, 225, 268.
Prochaska, George, 211.
Proctor, Prof., 134, 137, 139.
Proudhon, 72, 236, 237.
Prout, 425.
Pruner.—Bey, 180.
Puffendorff, 235.
Pulsky, Francis, 188.
Punsen, 191.
Pythagoras, 13, 16, 36, 55, 333.
Quatersages, 180, 183, 189.
Quenstedt, 147, 166, 373.
Querini, Cardinal, 163.
Quètelet, M., 244, 341.
Quinet, M., 240.

Raimond, 259, 260, 318.
Raphael, 22.
Raspe, 157, 158.
Rauch, 184.
Ravaisson, 337.
Rawlinson, 172, 184, 289, 325.
Ray, James, 154, 155, 159, 164, 171.
Regis, Pierre Silvain, 213.
Reich, 154.
Reid, Thomas, 217, 225, 297, 303.
Reimarius, 220, 259, 267, 311, 364, 381.
Reinhard, 222.
Reinkens, Bishop, 382.
Reisch, Gregory, 58.
Remusat, 180, 279.
Renan, 364.
Renouvier, M., 78, 313.
Reymond, Du Bois, 105, 211, 402.
Reynolds, 367.
Ribot, 207, 337.
Ricardo, 196, 249, 252.
Richet, 337.
Richter, 13.
Ripley, 313.
Ritter, 151, 243.
Robertson, Dr. Wm., 238.
Robespierre, 236.
Robinet, 318.
Robinson, 172.
Robson, 385.
Rochefoucauld, 217.
Rogers, Prof., 159.
Roget, 425.
Röhr, 381.
Rosencranz, 223, 344.
Rosmini, Antonio, 66, 122, 306, 344.
Rothe, 384.
Rousseau, 220, 236, 267, 363.
Row, 585.
Royce, 400.
Royer, Clemence, 176.
Rudiger, 216.
Rudolphi, 187.
Rusbroek, 314.
Russell, 237.

Sales, Frances de, 365.
Salmon, 383.
Salnasius, 235.
Sanchez, 392.
Saurez, 144.
Saussure, 151, 154.

Savage, 343, 400.
Savonarola, 202, 260.
Schaafhausen, 175, 192.
Schaff, 273, 383.
Scheffler, 404.
Schelling, 36, 64, 122, 209, 239, 269, 276, 291, 298, 304, 316, 330, 334, 340, 381, 395.
Schiller, 314.
Schlegel, 172, 184, 195, 231, 263.
Schleicher, 176, 188, 192.
Schleiermacher, 123, 269, 291, 352, 365, 384.
Schlieman, 172.
Schlozer, 231.
Scholten, 364.
Schomberg, 238.
Schoolcraft, 180, 184, 194, 249.
Schopenhauer, 64, 108, 121, 124, 209, 291, 301, 309, 313, 317, 320, 330, 345, 346.
Schubert, 133, 135, 136.
Scilla, 152.
Scott, Reginald, 205.
Scotus, Duns, 57, 202, 215, 318.
Scotus, John, 199.
Scuddifield, 105.
Sechi, 132.
Seelye, 298.
Selden, 235.
Semler, 365, 378, 379.
Seneca, 209, 234, 250.
Senkeshub, 282.
Servetus, 171.
Seth, 306, 320.
Shaftesbury, 220, 225.
Shakespeare, 176, 387, 388, 389.
Shedd, 129, 386.
Shelley, 346.
Sherlock, 325, 365.
Shuckford, 237, 271.
Sibyl, 169.
Sidney, 235.
Sieffert, 364, 380.
Siegfried, 278.
Sigwart, 414.
Simon, Father, 378.
Simon, St., 82, 231, 236, 243, 245, 251, 252, 275, 281.
Simonides, 13.
Sinclair, Thomas, 364.
Sirachi, 199, 201.
Smith, Dr., 385.
Smith, Adam, 231.
Smith, B., 396.
Smith, Goldwin, 240.
Smith, Hamilton, 187
Smith, John, 208.
Smith, Pye, 164.
Smith, Stanhope, 197.
Smith, William, 151.
Smyth, Piazzi, 180.
Socinus, 216, 223, 353.
Socrates, 13, 16, 17, 55, 194, 219, 264, 268, 317, 369.
Soldani, 151.
Somerville, 129.
Somerville, Mrs., 140, 161.
Sophocles, 264.
Sorley, 342.
Spencer, Herbert, 36, 54, 68, 74, 76, 82, 86, 93, 101, 103, 108, 207, 215, 246, 298, 312, 319, 329, 341, 361, 362, 365, 393, 397, 398, 399, 401.
Spiess, 265, 289, 308.
Spinoza, 124, 205, 213, 218, 235, 297, 307, 314, 330, 335, 340, 363, 378, 394.
Sprenger, 280.
Spurzheim, 211.
Squier, 189.
Stahl, 333.
Stallo, 338.
Standenmeier, 383.
Stanley, H. M., 78, 383.
St. Clair, 342.
Steno, Nicolaus, 150, 152.
Stephen, Leslie, 342.
Stevens, 172.
Stevens, E. T., 176.
Stewart, Dugald, 62, 68, 215, 218, 225, 303, 312, 402.
Stillingfleet, 164, 217.
Stirling, 298, 306.
St. Vincent, 241.
Stöckl, 396.
Storrs, Dr., 289, 325.
Strabo, 156.
Strauss, 124, 269, 283, 337, 340, 364, 382.
Strong, Prof., 374.
Struve, 132.
Stuart, Moses, 272.
Stuckenburg, 400.
Suarez, 200, 216, 232, 233.
Sumner, Charles, 251.
Swedenborg, 30, 122, 221, 273, 296, 353, 395.
Symmes, 160.

Tacitus, 264.
Taine, 337.
Tait, Prof., 104, 402.
Tappan, 217, 225.
Tatian, 430.
Tauler, 227, 314.
Taylor, Henry, 223.
Taylor, Isaac, 233.
Taylor, Jeremy, 218, 229, 255.
Telesius, 310, 391.
Tennyson, 346.

Tertullian, 103, 152, 199, 201, 209, 225, 227, 247, 260, 261, 263, 302, 317, 335, 358.
Thackeray, 346.
Theodorus, 237.
Theophilus, 430.
Theresa, 365.
Thierry, 231, 242.
Tholuck, 384.
Thompson, Dr. J. P., 196.
Thompson, Sir Wm., 161.
Tiedeman, 183, 191.
Tiedmann, 252.
Tillotson, 217.
Tindal, 260, 363, 365.
Tindal, Dr. Matthew, 267.
Titian, 171.
Tobias, 313.
Toland, 260, 266, 363, 365.
Tomasius, 365.
Tracy, Count de, 63, 211.
Trench, Bishop, 265, 277.
Trendelenberg, 292, 298, 306, 330.
Tschudi, 194.
Tulloch, 291.
Turgot, 231, 243, 252, 253, 275, 341.
Turnbull, 218.
Turretin, 142, 148, 168, 197, 224, 226, 373.
Tyler, 264.
Tylor, 188.
Tyndall, Dr., 262, 341.
Tyndall, Prof., 87, 102, 139, 399.

Ueberweg, 298, 330.
Ullmann, 273, 384, 431.
Ulrici, 207, 225, 298, 306, 330, 334, 396.
Urville, D', 185.
Usher, 168, 233.
Usteri, 395.

Vacherot, 337.
Valdini, Prof., 63.
Valentin, 179.
Vallisnieri, 152.
Van Dyke, Dr. J. F., 342.
Vanini, 274, 392.
Varro, 56.
Vater, 172.
Vaughn, 289.
Ventura, 61.
Vesalius, 171.
Vico, John Baptist, 84, 231, 240, 253, 274, 341.
Victoria, 230.
Vincent de Beauvais, 58, 163.
Virey, 187, 194.
Virgil, 169.
Virgilius, 163, 196.
Voetius,
Vogel, Otto, 337.
Vogt, 187, 191, 336, 340.
Volkelt, 345.
Volney, 193, 238, 267.
Voltaire, 137, 193, 238, 267, 346.
Von Ammon, 276, 381.
Von Baer, 179.
Von Buch, 151.
Von Bunsen, 264.
Von Gumpach, 134.
Von Hamel, 291.
Von Hellwald, 246.
Von Helmont, 393.
Von Lasaulx, 249.
Vrolik, 183.

Wace, Principal, 397, 427.
Wagner, 221.
Waitz, 181, 189.
Walckenaer, 242.
Waldeck, 189.
Wallace, 107, 174, 175, 185, 190, 194.
Wallis, John, 386.
Warburton, 324, 384.
Ward, Father, 338, 376, 377.
Ward, Mrs. Humphry, 364.
Warfield, 374.
Warren, 163.
Warrington, 375, 423.
Waterhouse, 186.
Watson, 325.
Watts, 374.
Webb, 320.
Weber, 183.
Wegscheider, 269.
Weigel, 377.
Weil, 280, 289.
Weir, John, 205.
Weisse, 221, 291, 334, 384.
Welch, 398.
Wellhausen, 364.
Werner, 151, 152.
Wesley, John, 255, 362.
Wessel, 202.
Westropp, Hadder, 177, 181.
Wettstein, 222.
Weygoldt, 345.
Whatley, 223.
Whedon, 218, 225.
Wherry, 289.
Whewell, 53, 65, 66, 74, 129, 138, 417.
Whichcote, 217.
Whiston, 155, 163, 417.
Whitby, 218, 220.
White, Edward, 385.

White, Prof. Andrew, 399.
Whitechurch, 394.
Whitfield, George, 255, 365.
Whitney, Prof., 172, 192.
Wickliff, 255.
Widenmann, 223.
Wilkinson, 184.
Wilson, John, 399.
Wilson, Prof. W. D., 61, 279.
Winchell, Prof., 138, 140, 161, 342.
Witsius, 272.
Witte, 313.
Wolfe, Christian, 63, 123, 206, 208, 213, 216, 221, 260, 268, 297, 308, 314, 330, 333, 352, 381, 394.
Wolsey, 250.
Woods, 374.
Woodward, William, 150, 152, 155, 164.
Woolsey, 289.
Woolston, 267, 363.
Wordrow, 343.
Wordsworth, 375.
Wright, Chauncey, 103.
Wundt, Prof., 292, 294, 415.
Wuttke, 225, 279.

Yäger, 176.
Youmans, Prof., 402.
Young, Prof., 107.

Zeller, 105, 276.
Zeno, 314.
Zenophanes, 314.
Zinzendorf, 353, 361, 362.
Zöckler, 436.
Zöllner, 337.
Zwingle, 256, 266.

PHILOSOPHIA ULTIMA:

OR SCIENCE OF THE SCIENCES.

VOLUME I.,

AN HISTORICAL AND CRITICAL INTRODUCTION ON THE FINAL PHILOSOPHY AS ISSUING FROM THE HARMONY OF SCIENCE AND RELIGION.

BY

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PROFESSOR IN PRINCETON COLLEGE.

Third Edition, Abridged and Revised. 8vo, $3.00.

The work of which this volume is the revised and abridged edition was received, when it was published several years ago, with a degree of favor rarely accorded to a book of its class. It was pronounced by both foreign and American critics to be a most important contribution to advanced philosophical thought, so clear in its treatment of abstruse questions, and so attractive in its style as to win the sympathy and interest of the general reader from the outset. Dr. Shields has remodelled and rewritten the work, and in its new and more condensed form it will appeal even to a wider constituency.

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